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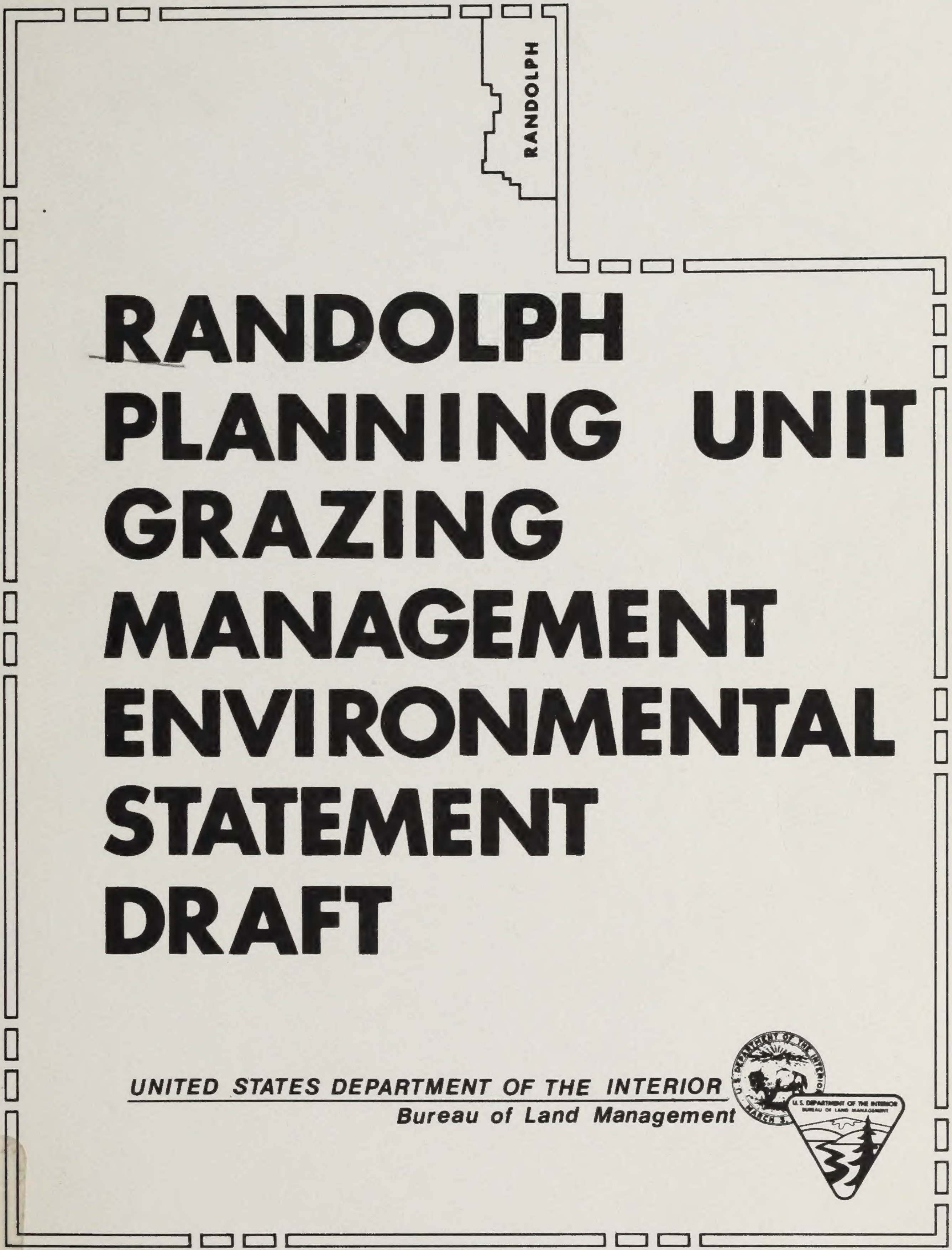

RANDOLPH PLANNING UNIT GRAZING MANAGEMENT ENVIRONMENTAL STATEMENT DRAFT

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DEPARTMENT OF THE INTERIOR

DRAFT

ENVIRONMENTAL STATEMENT

ON

GRAZING MANAGEMENT

IN THE

RANDOLPH PLANNING UNIT

RICH COUNTY, UTAH

PREPARED BY

BUREAU OF LAND MANAGEMENT

DEPARTMENT OF THE INTERIOR

Paul L Howard

STATE DIRECTOR, UTAH STATE OFFICE

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SUMMARY

(X) Draft ( ) Final Environmental Statement

Department of the Interior, Bureau of Land Management

1. Type of Action: (X) Administrative ( ) Legislative

2. Brief Description of Action: Livestock grazing management plans are proposed on 140,298 acres of public land in Rich County, Utah to provide sustained, long term, productive use of the natural resources. Objectives of proposed the action are: (1) to prevent continued decline of soil, water, and vegetation resources; (2) to improve forage condition, cover, and vigor; (3) to enhance wildlife habitat, including that for deer, and sage grouse; (4) to reduce soil loss from erosion; and (5) to provide long-term stability to the domestic livestock industry by sustaining forage productivity. These objectives would be accomplished by a two-part proposal. The first part, initial action, would allocate 22,350 AUMs of livestock forage on 19 allotments, a 7-percent reduction from the present authorized use of 24,124 AUMs. Livestock turn-on date would be determined each year dependent upon plant growth, but would be no later than June 1. Allotment-wide continuous grazing would be authorized on 15 allotments. Grazing management on the four remaining allotments would remain unchanged. The second part is designed to increase livestock forage on a sustained basis from 22,350 AUMs to 35,241 AUMs. Long-term management would be fully implemented within 10 years after filing of the FES and would include such range management practices as prescribed livestock grazing treatmets on 15 allotments, vegetation treatments (spraying, burning, seeding) on 14 allotments, fences, water developments, and cattleguards on 14 allotments. Three allotments are to remain at the initial level of management and public land on two allotments would be disposed of.

3. Summary of Environmental Impacts: The initial action would not measurably affect soil erosion. Existing condition and trend of vegetation would not change, however, forage production would decline by 10 percent. Condition of critical deer winter range would continue to decline, remaining in poor condition. BLM permittee income would be reduced; increased management would imapct local values and lifestyles.

Long term management would cause short duration air quality impacts. Soil erosion would increase on 506 acres and be reduced on 37,774 acres. Livestock forage condition would not measurably change; increased forage production from vegetation treatments would not be sustained. Quality deer forage shortages would occur on fair and poor condition ranges. Critical deer winter range would remain in poor condition. Long term management would partially offset initial income losses to permittee income. Season of use changes and restrictions on newly seeded areas would increase operating costs and alter livestock management practices.

Some of the identified adverse impacts would be mitigated by following alternatives.

4. Alternatives Considered:

   a. Elimination of all livestock grazing on public lands
   b. Restricted livestock use (utilization ceiling, no spring grazing, riparian habitat protection
   c. Reduction of adverse impacts to the proposed action
   d. No action (continuation of present management)
   e. Increased livestock grazing (vegetation treatments)

5. Comments Have Been Requested From the Following: (See attachment).

6. Date Statement Made Available to EPA and the Public:

Draft: JUN - 6 1979
Final:

Special Interest Groups

- Randolph Planning Unit livestock permittees
- Woodruff Cattlemen's Association
- Utah Cattlemen's Association
- Utah Wool Growers' Association
- Utah Farm Bureau
- Utah Wildlife & Outdoor Recreation Federation
- Utah Audubon Society
- ORV User Groups
- Sierra Club
- Weber County Trails
- Natural Resources Defense Council
  - Mr. James Morgan
- ISSUE
- Friends of the Earth
- National Wildlife Federation
- American Fisheries Society, Bonneville Chapter
- Wilderness Society of America
- National Council of Public Land Users
- Oregon Environmental Council
- Nevada Outdoor Recreation Association
- Ada County Fish and Game League

Local Governments, Commissions and Associations

- Bear Lake Regional Commission
- Bear Lake Association of Governments
- Rich County Commission
- Bear River Resource, Conservation, and Development Executive Council
- Bear River Basin Study, Coordinator
- Bear Lake Investigation Project

State Government and Universities

- Utah State Planning Office
- Utah Division of Wildlife Resources
- Utah Division of Water Resources
- Utah Division of Water Rights
- Utah Water Research Laboratory
- Utah Division of State Lands - Forestry and Fire Control
- Utah Geological and Mineral Survey
- Utah Division of Oil, Gas, and Mining
- Utah Division of Parks and Recreation
- Utah Department of Transportation, District 2
- Utah Outdoor Recreation Agency
- Utah State Historic Preservation Office, Department of Development Services
- Utah Division of Health, Bear Lake District
- Wyoming Game and Fish Department
- Utah State University, Logan, Utah
  - Range Extension Specialist
  - Sociology Department

        Anthropology Department
        Geography Department
        Reference and Extension Library
        Economic Research Service
        Cooperative Extension Service
        College of Natural Resources, Recreation Department

Federal Government
- Bureau of Reclamation
- Department of Agriculture, Forest Service
  - Regional Office, Region 4
  - Wasatch National Forest
  - Logan Ranger District
  - Ogden Ranger District
- Department of Agriculture, Soil Conservation Service
  - Agricultural Stabilization and Conservation Service
  - Logan Office
  - Randolph Office
- U.S. Fish and Wildlife Service
- U.S. Geological Service
- Environmental Protection Agency

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CHAPTER 1

DESCRIPTION OF PROPOSED ACTION

CHAPTER 1

DESCRIPTION OF THE PROPOSAL

SETTING

This grazing environmental statement (ES), completed by the Bureau of Land Management (BLM), has been prepared to analyze the impacts upon the people and the environment of Rich County, Utah as a result of implementing grazing recommendations for the Randolph Planning Unit.

Rich County is located in the northeast corner of Utah, next to the Idaho and Wyoming borders. Agriculture, especially calf production, has been the chief industry in Rich County since it was first settled in 1870. The Randolph Planning Unit, located entirely within the county, is administered by BLM from its District Office located in Salt Lake City, Utah. The planning unit is divided into 19 grazing allotments. See figure 1-1, Randolph Location Map, Bear Lake C map with Overlay inserted at the back of this volume, and table 1-1 for acreage breakdown. In general, the boundary of the Randolph ES area is also the boundary of the Randolph Planning Unit; minor exceptions are explained in Appendix 1, Land Status Details.

The planning unit contains 569,102 acres and ownership is scattered, with most of the 19 grazing allotments containing a mixture of public, private, and State lands. The private lands are usually located in the fertile valleys, and public and State lands are located on the less productive hillsides. This ES will address the effects of the proposed action on 140,298 acres of public land (25 percent) in the planning unit. It is assumed the adjacent State and private range lands would be similarly affected by the proposal.

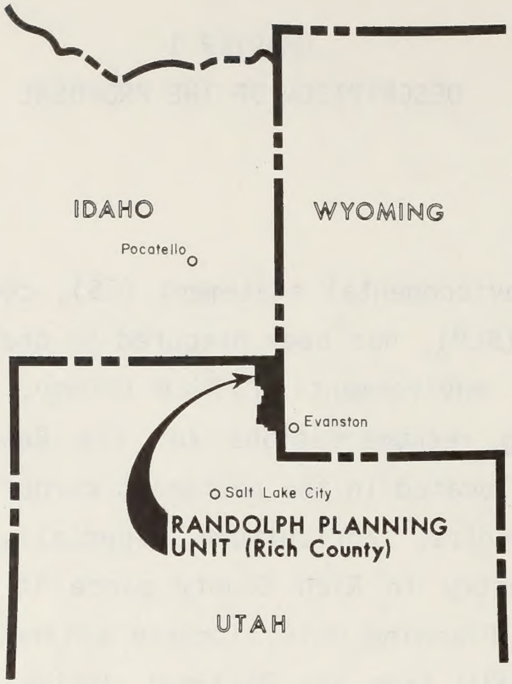


FIGURE 1-1
LOCATION MAP

TABLE 1-1

Acres and Ownership - Randolph Planning Unit

	Acres	Percent of Total
I. Total Acres in Randolph Planning Unit		
BLM Land	170,583	30
Forest Service	80	<1
State Land	47,237	8
Private Land	351,202	62
TOTAL	569,102	100
II. BLM Acres in Randolph Planning Unit		
Included in the Proposed Action	140,298	82.2
Not included:[a]	30,285	17.8
TOTAL	170,583	100.0

[a] See Appendix 1 for details.

EVOLUTION OF PROPOSED ACTION

This proposal has been developed as part of the BLM land use planning system. The goal of this system is to produce a land use plan (Management Framework Plan) which consists of multiple use recommendations. These multiple use recommendations - specifically the ones dealing with livestock grazing - constitute the proposed action of this environmental statement. The BLM planning system is explained in more detail in Appendix 2.

This planning process resulted in a proposed action for livestock management. This is a multiple use plan in the sense that it was developed after resource recommendations were made, conflicts among competing resource recommendations analyzed, and options formulated to solve or partially reduce specific land use conflicts. As a result, the proposal has been tailored to specific needs of vegetation, soils, wildlife resources, and socioeconomic values of the Randolph Planning Unit.

The following details the manner in which the various parts of the proposed action evolved:

Initial Action

This phase of the plan would be an immediate attempt to correct existing conditions and maintain existing resource values. The level of livestock use proposed under this action would be 22,350 Animal Unit Months (AUMs). The stocking level was determined after present carrying capacity was estimated and constrained by wildlife needs, watershed values, and land use changes. Land use changes included exclusion of livestock from select aquatic/ riparian habitats (8 miles), reduction of available livestock forage by 104 AUMs, and disposal and recreation site development of 2,618 acres of public land, further constraining livestock use by 316 AUMs. The season of use for livestock was determined during the planning process and was based on forage needs as well as the needs of livestock operators. The range readiness concept is proposed to determine the date livestock begin grazing public ranges so long as such turn-on occurs no later than June 1. This was done to accommodate the need of ranchers to graze in the spring. Present turn-off in the late fall - early winter would also change on critical deer winter ranges.

Long-Term

This part of the plan evolved from the need to sustain existing forage productivity, improve forage quality, and production. The grazing and resting treatments proposed (alternate spring, summer, fall grazing) are needed to provide more rest to forage species now grazed continuously during the growing season. Grazing management was constrained on critical deer winter range, resulting in more frequent and/or longer rest periods being proposed. The location and design of range developments proposed (fences and water developments) were constrained to accommodate other resources such as wildlife and visual resources. Vegetation treatments were proposed to provide more livestock forage. The 34,584 AUMs of possible forage would be restricted to 11,913 AUMs (actually proposed) after visual resource values, wildlife habitat (deer, aquatic/riparian, and sage grouse) were considered. This would result in fewer acres proposed for treatments, i.e., of a possible 103,752 acres, there would be 65,187 acres proposed for vegetation treatment.

For more details on how the proposed action evolved, refer to Appendix 3.

Public input has been important during each step in the planning process and during preparation and completion of this ES. After filing of the Final Environmental Statement, the Salt Lake District Manager will complete, with additional public involvement, Step 3 of the Management Framework Plan, which contains the multiple use decisions for the range management program. Thus, it should be noted that this ES is not a decision document, but only one step among several in the decision-making process. The livestock management program finally selected by the manager could be either the recommendations described here in Chapter 1 as the proposal, one of the alternatives described in Chapter 8, or a combination of the proposal and one or more alternatives.

PURPOSE AND OBJECTIVES

Purpose

The purpose of the proposal would be to overcome existing problems in livestock forage condition and production, wildlife habitat, and watershed condition. The proposal is also designed to maintain these areas in good resource condition. Approximately 5 percent of the area's livestock forage is in poor condition, 54 percent in fair, and 41 percent in good condition. Nearly 88 percent of the area's critical winter deer habitat and 48 percent of the sage grouse habitat is in poor condition. Most of the watershed (86 percent) is in a slight or moderate erosion class, and 3 percent is in a critical erosion class.

General Objectives

The main objective of the proposal would be to maintain and improve the vegetation resource on a sustained yield basis. Increasing livestock forage production would be a secondary objective. More specific objectives are listed in table 1-2.

Allotment Objectives

Livestock grazing would be managed on 19 existing range subunits or allotments within the Randolph ES area (fig. 1-1, and Overlay to Bear Lake C map at the back of this volume). Range management objectives relating to vegetation, soils, water quality, wildlife, and land use for each allotment are shown in table 1-3.

Forage Allocations

The proposed action allocates forage for cattle, sheep, deer, and antelope (Appendix 4). Existing use and proposed allocation of forage for the Randolph Planning Unit are shown in table 1-4 and summarized below:

TABLE 1-2

Objectives of the Proposed Action

Objective	Public Land Acreage[a]
VEGETATION, SOIL, WILDLIFE RESOURCES	
1. Maintain or increase the density and composition of forage plants on all allotments.	140,298
2. Maintain or improve the condition and ecological productivity of 27.5 miles of aquatic/riparian habitat by range management.	823
3. Improve the condition and ecological productivity of 8 miles of aquatic/riparian habitat (proposed for livestock exclusion).	208
4. Maintain or improve the existing condition of critical winter range for deer.	16,800
5. Maintain or improve the existing condition of livestock forage and stop the apparent downward trend on 41,887 acres; improve 75,811 acres with apparent static trend.	[b]127,848
FORAGE PRODUCTION AND USE	
6. Maintain the initial allocatin of 22,350 AUMs of livestock forage production on a sustained basis.	140,298
7. Maintain the initial allocation of 8,435 AUMs of deer forage production in the short term on a sustained basis.	140,298
8. Increase livestock forage production through management by 38 AUMs in the long term.	115,561
9. Increase deer forage production by 8,819 AUMs in the long term by vegetation treatment.	140,298
10. Increase livestock forage production through vegetation treatments by 11,913 AUMs in the long term.	65,187
11. Improve livestock distribution and achieve more uniform utilization on 19 allotments.	140,298

---

[a] Acres are not additive since many objectives overlap.

[b] Acres shown are suitable Federal acres which are data base for collection of certain resource inventory information.

TABLE 1-3

Range Management Objectives by Allotment

Objective	Allotment	Total Acres Public Land
VEGETATION		
1. Maintain existing diversity. Manage ranges for long-term stability of vegetation community. Specific objectives for grazing systems should maintain or change existing composition of the plant community, depending upon the needs in the allotment. Maintain vegetation cover.	All 19 allotments	140,298
2. Maintain existing livestock forage condition and trend. Specific objectives should maintain present composition and density of key species, provide for their physiological needs, and maintain vigor. Use key species to monitor condition.	Middle Ridge, Session, Eastman, Deseret, and South Woodruff	24,735
3. On allotments proposed for improved management, improve existing livestock forage condition and trend. Increase composition and density of key species; provide for physiological needs and improve vigor. Maintain composition of newly established seedings. Grazing systems provide that no pasture be grazed more than 2 years in a row during the spring growing period (5/1-6/30) before receiving 1 year's rest during that period. In addition, every pasture must be rested from grazing until seed ripe (7/31) at least once every 5 years. Limit utilization of desirable forage species by livestock to 50 percent for grass and 60 percent for browse. Use key species for monitoring.	Bear Lake, Big Creek, Dry Basin, Duck Creek, East Woodruff, Kearl, Laketown, Meachum Canyon, New Canyon, Rabbit Creek, Sage Creek, Stuart, Twin Peaks, and Woodruff Pastures	115,561
SOILS		
4. Maintain or improve existing plant cover. Design management objectives to improve soil productivity and reduce erosion from runoff. Maintain or improve present composition of key species such as perennial grass (*Agropyron cristatum* ad *Ag. spicatum*).	All 19 allotments	140,298
WATER QUALITY		
5. Maintain or improve existing water quality. Reduce concentrations of livestock in stream areas and fragile watersheds. Locate developments where they would not degrade existing water quality. Improve plant cover on watersheds and maintain or improve streambank cover and stability along waterways.	Middle Ridge, South Woodruff, Big Creek, Duck Creek, Laketown, Meachum Canyon, New Canyon, Rabbit Creek, Sage Creek, Twin Peaks, and Woodruff Pastures	112,727
LAND USE		
6. Allow livestock use consistent with maintaining existing resource productivity until public land disposal.	All of Middle Ridge and Session; parts of Bear Lake, Big Creek, Deseret, Duck Creek, Eastman, New Canyon, Sage Creek, and Woodruff Pastures	2,611
7. Maintain or increase existing forage productivity and allow maximum level of livestock and wildlife use consistent with maintaining this level.	All but disposal, recreation, and riparian acres	137,472
8. Maintain or improve existing visual/recreation (natural) values and manage livestock grazing consistent with preserving these values.	Laketown and Twin Peaks	7

(continued)

TABLE 1-3 (concluded)

Objective	Allotment	Total Acres Public Land
WILDLIFE		
9. Maintain or improve existing habitat condition and forage quality on critical deer winter range. Maintain or improve existing production of deer forage as well as the percent composition of grass, forbs, and browse. Use key browse species such as *Artemisia tridentata*, *Purshia tridentata*, *Amelanchier* sp. and *Cercocarpus montanus* to monitor habitat condition.	Bear Lake, Big Creek, Deseret, Eastman, Laketown, Meachum Canyon, South Woodruff, Stuart, and Woodruff Pastures	16,800
10. On allotments proposed for seeding to improve winter range habitat condition, maintain seeded compositions at 50 percent grass, 10 percent forbs, and 40 percent browse.	Big Creek, Laketown, Meachum Canyon, Stuart, and Woodruff Pastures	12,998
11. Maintain or improve condition of season-long deer habitat, especially species diversity. Provide for increased succulent forage and cover. Use key species to monitor condition.	Big Creek, Dry Basin, Duck Creek, Eastman, East Woodruff, Kearl, Laketown, Meachum Canyon, Middle Ridge, New Canyon, Rabbit Creek, Sage Creek, Session, South Woodruff, Twin Peaks, and Woodruff Pastures	107,931
12. Improve habitat condition of season-long range on allotments proposed to receive vegetation treatment. Maintain long-term productivity of these seedings. Maintain seeded composition at 65 percent grass, 10 percent forbs, and 25 percent browse. Use key species to monitor condition.	Big Creek, Dry Basin, Duck Creek, East Woodruff, Kearl, Laketown, Meachum Canyon, New Canyon, Rabbit Creek, Sage Creek, Twin Peaks, and Woodruff Pastures	101,253
13. Maintain or improve sage grouse habitat. Restrict project construction during breeding period (4/1-6/15). Design grazing systems to maintain vigor and composition of *Artemisia tridentata*, and succulents (*Taraxacum* sp. and *Sphaeralcea* sp.).	Big Creek, Deseret, Dry Basin, Duck Creek, East Woodruff, New Canyon, Sage Creek, South Woodruff	Not available[a]
14. Maintain existing plant composition and density. Utilize forage within available supply to maintain habitat for proposed future antelope introductions. Range developments should be compatible with antelope needs. Vigor of key species such as those mentioned for sage grouse should be maintained.	Dry Basin, Duck Creek, Rabbit Creek, Sage Creek	29,601
15. Reduce livestock use and concentration in aquatic/riparian habitats, especially during critical fish spawning and growth periods (5/1-8/30). Livestock management should improve vegetation density and ground cover along streambanks. Management practices should reduce livestock use in riparian areas by management practices (herding, salting, water hauling). Key species for grazing system design and monitoring studies will be willow *Salix* sp. Improve fishery quality on fenced portions of selected streams (MFP). On other areas, improve vegetation density and ground cover along streambanks (MFP) and design grazing systems to upgrade or maintain present livestock condition and quality. Range developments should reduce livestock concentrations in stream bottoms.	Big Creek, Duck Creek, Laketown, Meachum Canyon, Middle Ridge, New Canyon, Rabbit Creek, Sage Creek, South Woodruff, Twin Peaks, and Woodruff Pastures	1,031

NOTE: Key species used to measure the attainment of these objectives are identified either within the specific objective or in Appendix 5.

[a] Acres of sage grouse habitat not available; however, there are 17 known strutting grounds within or adjacent to these allotments.

TABLE 1-4

Summary of Existing and Proposed Grazing

	EXISTING LIVESTOCK AND DEER GRAZING SITUATION					PROPOSED FORAGE ALLOCATION						
								AUMs Available From			Full Implementation of Proposed Action	
Allotment (Total Public Land Acres)	Available Forage AUMs	Season of Use	Present Grazing Preference AUM	Past Active Authorized Use (AUMs)	Estimated Current Deer Use^{a} (AUMs)	Initial Allocation (AUMs)	Initial Season$_{b}$ of Use	Water Development	Management	Vegetation Treatment	Total AUMs Allocated	Season of Use^{c}
DISPOSAL												
Late spring/summer/fall/early winter												
One Allotment (Middle Ridge) 1,286 acres												
Total Livestock	202	6/1-11/24	112	103	.....	202	6/1-11/24	.....	.....	.....	* * Elimination * *	
Deer	405	Season long	.....	.....	59	59	....	.....	.....	.....	* * Elimination * *	
Other Uses^{c}	.....	....	.....	.....	.....	0	....	.....	.....	.....	202	....
Spring/summer/early fall (RR)												
One Allotment (Session) 238 acres												
Total Livestock	40	5/16-9/15	40	40	.....	40	RR - 9/30	.....	.....	.....	* * Elimination * *	
Deer	98	Season long	.....	.....	14	14	....	.....	.....	.....	* * Elimination * *	
Other Uses^{c}	.....	....	.....	.....	.....	0	....	.....	.....	.....	40	....
CONTINUE INITIAL ACTION MANAGEMENT: ALLOTMENT-WIDE GRAZING												
Spring/summer/fall (RR)												
One Allotment (Eastman) 3,405 acres												
Total Livestock	612	5/1-10/15	696	648	.....	612	RR - 10/15	.....	.....	.....	612	RR - 10/15
Deer	1,111	Season long	.....	.....	156	156	....	.....	.....	.....	1,111	....
Critical winter	198	....	.....	.....	68	68	....	.....	.....	.....	198	....
Antelope	80	....	.....	.....	.....	.....	....	.....	.....	.....	80	....
Other Uses^{c}	16	....	.....	.....	.....	16	....	.....	.....	.....	16	....
Spring/summer/early fall (RR)												
Two Allotments (Deseret and South Woodruff) 19,808 acres												
Total Livestock	3,376	5/1-12/31	3,505	2,794	.....	3,376	RR - 9/30	.....	.....	.....	3,376	RR - 9/30
Deer	438	Season long	.....	.....	190	190	....	.....	.....	.....	438	....
Critical winter	2,331	....	.....	.....	1,035	1,035	....	.....	.....	.....	2,331	....
Antelope	140	....	.....	.....	.....	.....	....	.....	.....	.....	140	....
Other Uses^{c}	38	....	.....	.....	.....	38	....	.....	.....	.....	38	....
IMPLEMENT IMPROVED MANAGEMENT												
Spring/summer/early fall (RR)												
Five Allotments (Bear Lake, Dry Basin, Kearl, Laketown, Stuart) 9,445 acres												
Total Livestock	1,182	5/10-9/30	1,598	1,544	.....	1,182	RR - 9/30	75	.....	264	1,521	RR - 9/30
Deer	2,183	Season long	.....	.....	301	301	....	.....	.....	76	2,259	....
Critical winter	1,040	....	.....	.....	416	416	....	.....	.....	201	1,241	....
Other Uses^{c}	39	....	.....	.....	.....	39	....	.....	.....	.....	39	....

(continued)

TABLE 1-4 (concluded)

	EXISTING LIVESTOCK AND DEER GRAZING SITUATION					PROPOSED FORAGE ALLOCATION						
								AUMs Available From			Full Implementation of Proposed Action	
Allotment (Total Public Land Acres)	Available Forage AUMs	Season of Use	Present Grazing Preference AUM	Past Active Authorized Use (AUMs)	Estimated Current Deer Use (AUMs)[a]	Initial Allocation (AUMs)	Initial Season of Use[b]	Water Development	Management	Vegetation Treatment	Total AUMs Allocated	Season of Use[c]
Spring/summer/early winter (RR)												
Seven Allotments (Big Creek, Duck Creek, Meachum Canyon, New Canyon, Sage Creek, Twin Peaks, Woodruff Pastures) 100,692 acres												
Total Livestock	16,273	5/10-12/31	17,525	17,110	.....	16,273	RR - 11/30	1,107	38	11,332	28,712	RR - 12/31
Deer	16,221	Season long	.....	.....	4,616	4,538	....	.....	.....	7,654	23,875	....
Critical winter	1,992	....	.....	.....	1,377	1,377	....	.....	.....	543	2,535	....
Antelope	129	....	.....	.....	.....	.....	....	.....	.....	.....	129	....
Other Uses[c]	329	....	.....	.....	.....	329	....	.....	.....	.....	329	....
Spring/summer/fall (RR)												
Two Allotments (East Woodruff, Rabbit Creek) 5,424 acres												
Total Livestock	665	5/1-1/7	648	659	.....	665	RR - 10/10	.....	.....	355	1,020	RR - 10/31
Deer	1,465	Season long	.....	.....	281	281	....	.....	.....	345	1,810	....
Antelope	23	....	.....	.....	.....	.....	....	.....	.....	.....	23	....
Total Acres	140,298											
TOTAL LIVESTOCK	22,350	....	24,124	22,898	.....	22,350	....	1,182	38	11,913	35,241	....
TOTAL DEER	27,482	....	.....	.....	8,513	8,435	....	.....	.....	8,819	35,798	....
TOTAL ANTELOPE	372	....	.....	.....	.....	.....	....	.....	.....	.....	372	....
TOTAL OTHER USES[c]	422	....	.....	.....	.....	422	....	.....	.....	.....	[d]664	....

---

[a] Estimated deer demand interpreted from Utah DWR estimates of existing needs.

[b] RR = Turn-on date for livestock grazing would be determined by range readiness estimated to be May 15 (Appendix 5) but would not be later than June 1. Turn-on for other allotments would be based on the date indicated. The end of the grazing season would be indicated by latest date shown.

[c] RR = Turn-on date for livestock grazing would be based on range readiness (Appendix 5) estimated to be no earlier than May 10 each year. The end of grazing season would be indicated by date shown.

[d] Other Uses means forage foregone to riparian fencing, recreation site development, and land disposal.

NOTE: Proposed forage allocation for deer would be available from livestock vegetation treatment projects. The figure represents additional AUMs available to deer and would include summer and winter range forage needs. Total proposed deer forage allocation would be obtained by the addition of the initial level of use and any additional forage from vegetation treatment. There would be no quantifiable increase in deer AUMs from proposed range management, although quality would be expected to improve.

Past active authorized use should normally be within present grazing preference; where it is higher, the difference is attributable to temporary nonrenewable use (see Glossary). Past active authorized use is a 5-year average (1974 to 1978).

Available forage AUMs are best available estimates. Initial level of use is the proposed stocking level which is based on survey data and other resource information (Appendix 6).

Additional AUMs available from management and land treatment would be proposed for allocation to livestock. These AUMs represent forage that could be utilized by sheep and cattle. For allotments where no additional AUMs are shown, it is not possible to quantify any added increase in forage supply, although it would be expected that forage quality would be improved from the proposed management.

Proposed Allocation of Forage

	Initial	Probable Long Term
Livestock	22,350	35,241
Deer	8,435	35,798
Antelope	0	372
Other Uses	422	664

The criteria used to determine the initial stocking level for each of the 19 allotments are contained in the Randolph MFP and are also summarized in Appendix 6 (Level of Use).

Under the proposal, existing grazing would be further reduced by 422 AUMs because of three additional actions proposed in the Randolph MFP:

1. Certain public lands would be exchanged or sold
2. Two recreation sites would be developed
3. Livestock would be excluded from 8 miles of riparian habitat

The proposed action would also require the construction of range developments such as fences and water developments. Vegetation treatments are also proposed to increase the amount of livestock and wildlife forage. These projects are shown on table 1-5. Design restrictions are discussed in Design Restrictions and Standard Operation Requirements section.

INITIAL ACTION (AND ITS IMPLEMENTATION)

The initial action is designed to correct overuse of livestock forage species and to bring livestock grazing into line with forage availability and the resource management objectives listed in table 1-2. The initial action would adjust livestock grazing according to season of use, level of use (or AUMs), class of livestock, and areas where livestock grazing would be authorized.

TABLE 1-5

Proposed Range Developments and Implementation Schedule by Allotment

Implementation Year		Improved Management Allotments	Public Land Acres Imple- mented	Vegetation Treatments			WATER DEVELOPMENTS				Fences		Total Main- tenance Cost[c]	Total[d] Cost
				Acres[a]			Wells		Pipeline[b]					
Start	Finish			Spray	Burn	Cost	Number	Cost	Miles	Cost	Miles	Cost		
1	3	Dry Basin Pasture	2,625	0	0	0	0	0	0	0	0	0	0	0
1	6	Bear Lake	1,198	595	0	$ 4,165	1	$ 10,500	0	....	2	$ 3,000	$ 675	$ 18,340
1	6	Dry Basin	2,781	2,279	0	15,953	0	0	4	$13,200	6	9,000	1,110	39,263
1	6	Rabbit Creek	3,257	3,177	0	22,239	1	10,500	0	0	4	6,000	825	39,564
2	7	Kearl	1,183	479	0	3,353	3	31,500	0	0	4	6,000	1,875	42,728
2	7	Duck Creek	13,410	10,099	878	76,839	2	21,000	0	0	15	22,500	2,175	122,514
3	8	Laketown	3,241	215	7	1,554	2	21,000	0	0	9	13,500	1,725	37,779
3	8	Big Creek	20,346	13,211	1,975	106,302	4	42,000	0	0	12	18,000	3,000	169,302
3	8	Woodruff Pastures	19,250	11,206	1,675	90,167	1	10,500	3	9,900	0	0	0	110,567
4	9	New Canyon	30,665	9,987	100	70,609	3	31,500	0	0	13	19,500	2,550	124,159
4	9	East Woodruff	2,167	386	0	2,702	5	52,500	0	0	2	3,000	2,775	60,977
4	9	Meachum Canyon	1,951	1,557	0	10,899	1	10,500	0	0	3	4,500	750	26,649
5	10	Sage Creek	10,153	5,640	174	40,698	1	10,500	0	0	8	12,000	1,125	64,323
5	10	Twin Peaks	2,292	796	0	5,572	0	0	0	0	0	0	0	5,572
5	10	Stuart	1,042	488	263	5,257	0	0	1	3,300	0	0	165	8,722
		TOTAL	115,561	60,115	5,072	$456,309	24	252,000	8	$26,400	78	117,000	18,750	870,459

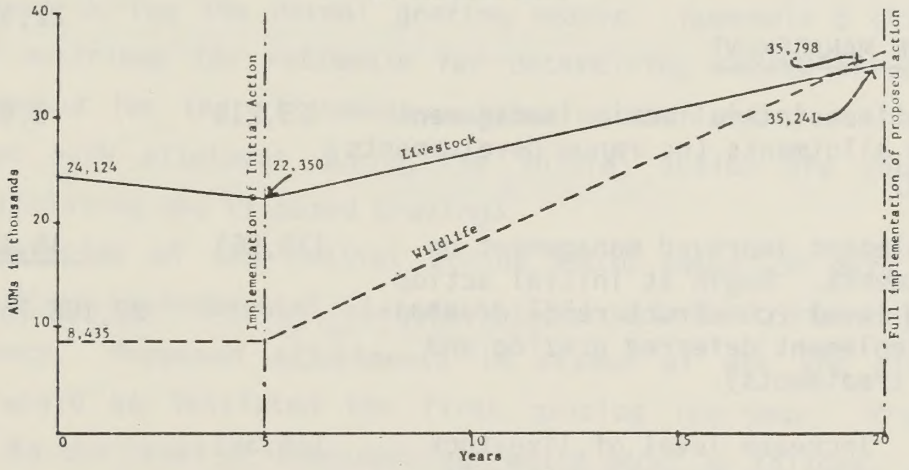
NOTE: Middle Ridge and Session Allotments are not included. Elimination of grazing is proposed to be completed within 6 years. Deseret, South Woodruff, and Eastman are not included. Proposed initial management would begin on the first year of implementation and continue until blocking of public lands makes improved management feasible.

This is the best estimate of an implementation schedule. The actual implementation sequence would depend on the willingness of the range users to cooperate and the availability of funding and manpower.

[a] Vegetation treatment by chemical spraying or burning would be acceptable (multiple use planning) on the acreages shown. The indicated costs are averaged based on treatment by either method. Spraying or burning at $7.00 per acre.
[b] Small watering troughs would be placed at predetermined intervals along pipeline.
[c] Cost per year for new projects only.
[d] Includes first year's maintenance cost.

The proposed initial action would adjust the existing level of livestock use in the Randolph Planning Unit from 24,124 AUMs to 22,350 AUMs (see sketch below). The actual adjustment in use on the ground is not precisely known. Past active authorized use for 5 years is 22,898 AUMs (Appendix 4). It is assumed this is very near actual use (at least within 10 percent). This adjustment is based on the amount of livestock forage which is allocated on the 140,298 acres of public land managed by BLM and included in this proposal. The proposed initial action would also adjust the existing season of use. As table 1-6 indicates, adjustments in livestock use (level and season) would occur on 18 allotments, but on one allotment - Woodruff Pastures - there would be no change in livestock use. Appendix 2 identifies acres within specific allotments where livestock grazing would not be authorized because of multiple use planning constraints.

PROPOSED FORAGE ALLOCATION



Turn-on (the date livestock are allowed into an allotment) would be based on plant growth and would allow for livestock use as soon as key livestock forage species reached a predetermined growth stage, which would be measured annually. In no case would turn-on occur later than June 1 each year. Turn-on, based on range readiness (RR), is proposed for 13 allotments. Currently, these allotments have turn-on earlier than the estimated May 15 date. Turn-on for the remaining six allotments would be a fixed date each year. The existing livestock turn-on

TABLE 1-6

Summary of Proposed Action

	Public Land Acres	Level of Livestock Use (AUMs)
INITIAL ACTION		
1. Continue existing management (season and level of use) Woodruff Pastures Allotment. Adjust management objectives for wildlife.	21,875	4,825
2. Proposed change to existing management on 18 allotments. Changes made to season and level of use and acres authorized for livestock grazing.	118,423	17,525
3. Allotments proposed for disposal (two allotments).	1,524	(242)
		22,350 Total
LONG-TERM MANAGEMENT		
1. Continue initial action management on three allotments (no range developments proposed).	23,213	3,988
2. Implement improved management on 14 allotments. Begin at initial action stocking level (construct range developments, implement deferred grazing and resting treatments).	115,561	18,120
		22,108 Total
a. Increase level of livestock use as more forage becomes available from management.	115,561	38
b. Increase level of livestock use as more forage becomes available from vegetation treatment (spraying and burning).	65,187	11,913
c. Increase level of livestock use as more forage becomes avaiable from additional water development.		1,182
		35,241 Total

dates for Middle Ridge and Stuart Allotments, June 1 and May 16 respectively, are later than the estimated May 15 date. Management objectives are being achieved. East Woodruff, Meachum Canyon, Twin Peaks, and Woodruff Pastures Allotments have existing grazing systems. Present turn-on dates for these allotments are achieving initial action management objectives. Turn-off (the date livestock come off the allotment) would be based on resource needs, operator flexibilities, and management objectives.

Allotment-wide continuous grazing would be proposed for 15 of the 19 allotments during the initial action only until improved management would be implemented in the long term (fig. 1-2). This would not change the existing livestock management on these allotments, although the existing season and level of use would be modified. Grazing on the remaining four allotments would remain unchanged, and would continue to employ periodic deferment of livestock grazing in select portions of each allotment during the normal grazing season. Appendix 5 (Kind of Management) describes the rationale for determining season of use and grazing proposed for the allotments. Actual season and level of use proposed for each allotment during the initial action are shown in Appendix 4 (Existing and Proposed Grazing).

Implementation of the initial action would begin 30 days after filing the Final Environmental Statement (FES) with Environmental Protection Agency. Proposed adjustments in season of use and kind of management would be initiated the first grazing fee year. Proposed adjustments to the level of livestock use would occur as follows:

1. Proposed reductions (less than 15 percent of existing level of use) would be imposed in full the first grazing fee year following filing of the FES. Proposed reductions of 15 percent or greater would be divided into three equal amounts imposed over a 3-year period.

2. Increases in livestock use proposed in the initial action would be authorized on a nonrenewable basis. For those allotments that now utilize grazing treatments and which would continue with such management along with an increase in livestock use, the proposed increases

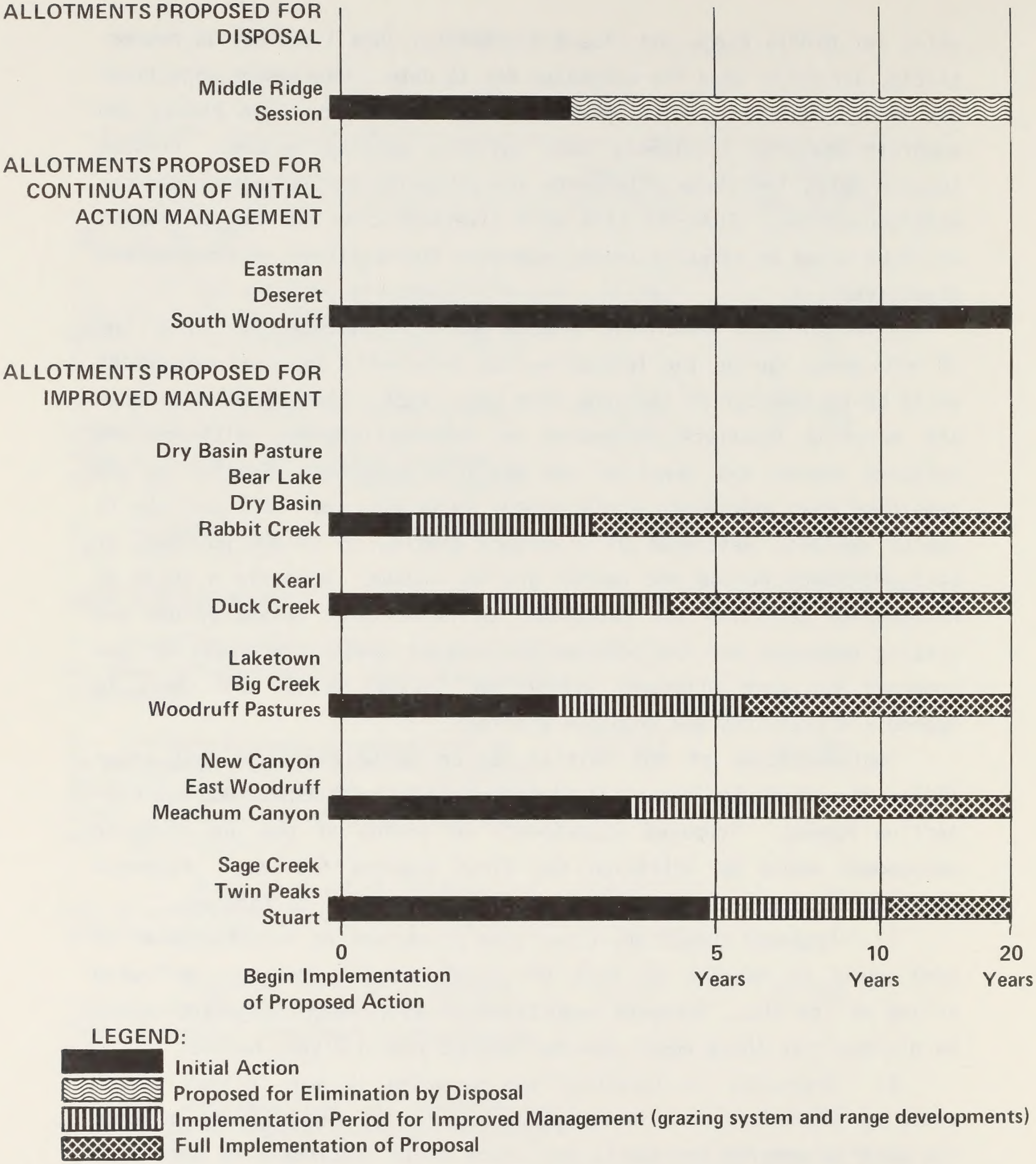


FIGURE 1- 2

PROPOSED IMPLEMENTATION SCHEDULE

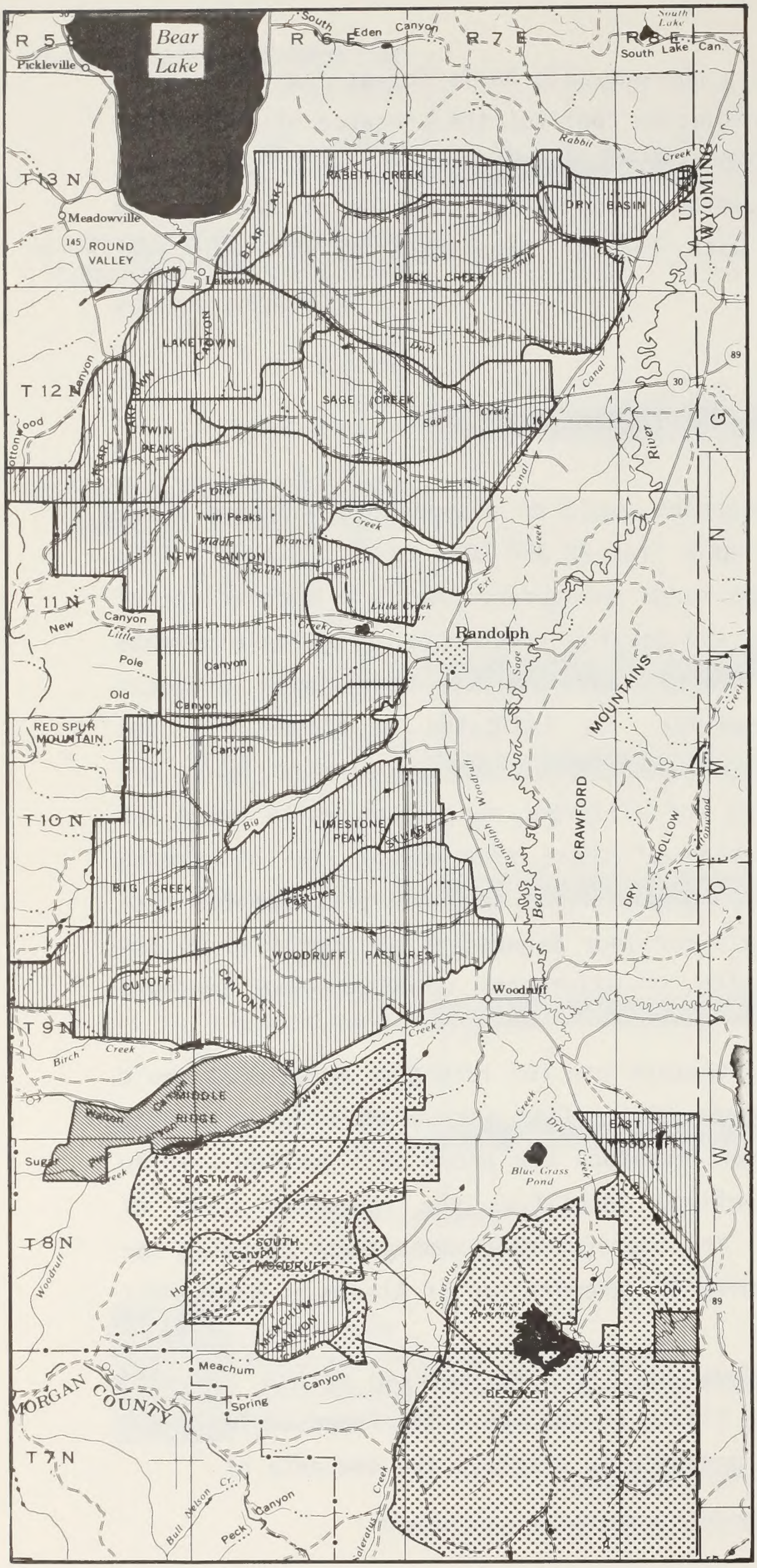
would also be authorized on a nonrenewable basis for at least one grazing cycle. If subsequent evaluation confirms the presence of additional forage (and the attainment of other management objectives), the forage would be allocated for livestock use in satisfaction of the grazing preference and consistent with Federal Regulation 43 CFR 4110.3-1.

LONG-TERM MANAGEMENT (AND ITS IMPLEMENTATION)

Proposed long-term management would be designed to increase livestock forage on a sustained basis from 22,350 AUMs to 35,241 AUMs. This action would include improved range management practices such as use of prescribed livestock grazing and resting treatments, range developments (fences and water installations), and vegetation treatment projects (spraying, burning, and seeding). As indicated in figure 1-3, the allotments would receive different types of management. Table 1-7 identifies the acres proposed for different management while table 1-8 indicates the expected duration of these treatments. Two allotments would receive no long-term management since they are proposed for disposal. Three allotments would continue management as specified in the initial action. The remaining 14 allotments would receive improved long-term management.

The proposed level of livestock use for long-term management would begin at the level set forth in the initial action and then, as forage resources increase, additional livestock use would be allocated. Table 1-6 (Summary of Proposed Action) identifies the increased level of livestock use for this step. The improved range management proposed for various allotments would require the preparation of Allotment Management Plans (AMPs).

Long-term management would be fully implemented within 10 years from the first year following filing of the FES. The Proposed Implementation Schedule, figure 1-2, graphically displays the sequence of



RANDOLPH RANGE ES

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4 2 0 4

SCALE IN MILES

LEGEND

▨ DISPOSAL

	late spring	summer	fall	early winter
Middle Ridge	6-1/6-30	7-1/8-31	9-1/10-31	11-1/12-31

	spring	summer	early fall
Session	RR5-15/6-30	7-1/8-31	9-1/9-30

░ CONTINUE INITIAL ACTION MANAGEMENT: ALLOTMENT-WIDE GRAZING

	spring	summer	fall
Eastman	RR5-15/6-30	7-1/8-31	9-1/10-31

	spring	summer	early fall
Deseret South Woodruff	RR5-15/6-30	7-1/8-31	9-1/9-30

▥ IMPLEMENT IMPROVED MANAGEMENT

	spring	summer	early fall
Bear Lake, Dry Basin, Kearl, Laketown, Stuart	RR5-10/6-30	7-1/8-31	9-1/9-30

	spring	summer	fall	early winter
Big Creek, Duck Creek, Meachum Canyon, New Canyon, Sage Creek, Twin Peaks, Woodruff Pastures	RR5-10/6-30	7-1/8-31	9-1/10-30	11-1/12-31

	spring	summer	fall
East Woodruff, Rabbit Creek	RR5-10/6-30	7-1/8-31	9-1/10-31

RR = Range Readiness

FIGURE 1- 3

PROPOSED ACTION COMPONENTS

TABLE 1-7

Proposed Grazing Management

	Acres
INITIAL ACTION	
Continuous grazing (spring, summer, fall) 15 allotments	112,013
Existing grazing systems (alternate during spring, summer, fall) 4 allotments	28,285
LONG-TERM MANAGEMENT	
Continuous grazing (spring, summer, fall) 3 allotments	23,213
Rotational deferred grazing and resting treatments (alternate grazing during the spring, summer, fall) 14 allotments	115,561

implementation by allotment. Long-term management would begin with the establishment of the grazing systems, fencing, and water developments and continuation of the land treatment projects.

Allotments Proposed for Disposal

Two allotments (Middle Ridge and Session) involving 1,524 acres of public land are proposed for disposal by exchange or sale of public lands within them. This would result in the loss of 242 AUMs of livestock forage. Although public land in these two allotments is contiguous, it comprises a small portion of the total area (17 percent of Middle Ridge and 20 percent of Session) making it impractical for BLM to continue to authorize livestock grazing since protection of soil, plants, and other resources would be prohibitively expensive. When the public land would be sold or exchanged is uncertain, but disposal would occur within 5 years from the implementation of initial action. Until the proposed disposal, livestock use as prescribed under the initial action would continue.

TABLE 1-8

Proposed Duration of Grazing Treatments

	Acres[a]
CONTINUOUS GRAZING[b]	
Up to 1 year duration	9,861
2 years	14,593
3 years	20,962
4 years	30,665
5 years	12,719
Duration throughout proposal	23,213
ROTATIONAL DEFERRED GRAZING AND RESTING TREATMENTS[c]	
Continue existing treatments throughout proposal	28,285
Begin Year 1 and continue throughout proposal	9,861
Year 2	14,593
Year 3	20,962
Year 4	30,665
Year 5	11,195

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[a] This includes total acres.

[b] Does not include 28,285 acres in Woodruff Pastures, East Woodruff, Meachum Canyon, and Twin Peaks Allotments already under grazing treatments.

[c] Does not include 23,213 acres in Eastman, Deseret, and South Woodruff Allotments which are proposed for continuous grazing or 1,524 acres proposed for disposal (Middle Ridge and Session Allotments).

Allotments Proposed For Continuation of Initial Action Range Management

There are three allotments (Eastman, Deseret, and South Woodruff) involving 23,212 acres of public land in this category. The proposed long-term range management would be a continuation of the initial action. There would be no improved management or range developments. Intensive management would not be feasible since State and private lands constitute more than 65 percent of the acreage in these allotments (see maps in pocket on inside cover). The continuation of the initial action range management would, however, still regulate livestock use. The proposed level and season of livestock use are shown in Appendix 4. Specific objectives are shown in table 1-3.

Allotments Proposed for Improved Range Management

This component of the proposal involves 14 allotments (Bear Lake, Dry Basin, Kearl, Laketown, Stuart, Big Creek, Duck Creek, Meachum Canyon, New Canyon, Sage Creek, Twin Peaks, Woodruff Pastures, East Woodruff, and Rabbit Creek) and 115,561 acres of public land.

Specific grazing and resting treatments, designed to meet plant physiological requirements and land use needs as identified in the BLM planning process, would be developed to improve livestock forage. Livestock distribution and control would be accomplished by new fences and additional water sources. Improved range management practices would increase livestock forage 1,220 AUMs within 20 years.

Vegetation treatments (spraying and/or burning) followed by reseeding would replace less desirable livestock forage species with those desirable to both livestock and wildlife. It is anticipated that these treatments would result in an additional 11,913 AUMs of livestock forage, for a total of 35,241 AUMs.

There are four allotments (Woodruff Pastures, Twin Peaks, Meachum Canyon, and East Woodruff) where existing grazing practices are proposed for change if these existing systems do not meet management objectives. The proposal assumes this would occur and it would be necessary to implement improved range management on 28,285 acres and an initial level of 5,713 AUMs (Appendix 4). More restrictive grazing and resting treatments are proposed to increase the amount of desirable wildlife browse. For example, it is proposed that the existing grazing season in the Woodruff Pastures Allotment be modified so that no livestock use is authorized beyond November 30 each year. This turn-off date is proposed because deer habitat in that allotment is in poor condition due to grazing competition between sheep and deer on critical deer winter range.

Also, additional vegetation treatments are planned which would increase livestock forage for these four allotments. In addition, turn-on dates would change. The four allotments now have fixed turn-on dates; more flexibility would be allowed in accordance with the readiness of the livestock forage (Appendix 5, Season of Use section). Specific seasons and levels of livestock use proposed for these four allotments are shown in Appendix 4.

The remaining 10 allotments proposed for improved range management (Bear Lake, Dry Basin, Kearl, Laketown, Stuart, Big Creek, Duck Creek, New Canyon, Sage Creek, and Rabbit Creek), would involve 87,276 acres and an initial level of 12,407 AUMs on public lands (table 1-6). Objectives for these allotments are aimed at improving forage quality and increasing production, therefore, rotational growing season deferment grazing is proposed (table 1-3). Specific grazing and resting treatments for the 10 allotments, their purpose, and criteria for selection, and the proposed season and level of use are shown in Appendixes 4 and 5. Proposed treatments are summarized on table 1-9. Range developments and vegetation treatments proposed for these allotments are shown in table 1-5 and described in detail below:

Range Developments

There are two types of range developments proposed: fences and water developments (wells and pipelines). Normally, sources of permanent water in each pasture would be fenced so that livestock would be prevented from damaging the source.

These developments (table 1-5) would help accomplish the management objectives (table 1-3) because fences and water developments would improve the control and distribution of livestock and would improve the use of key forage species.

These structures would also be located so that livestock would not gather in habitual areas and would not graze as heavily on key areas, e.g., aquatic/riparian habitats.

Vegetation Treatments

Vegetation treatments are proposed for a total of 65,187 acres in 14 allotments (table 1-5). The allotments and AUMs involved are shown in Appendix 4. The desired vegetation composition for treated areas is shown in table 1-3. The purpose of these treatments would be to increase the amount of desirable livestock forage by the removal of

TABLE 1-9

Summary of Proposed Grazing and Resting Treatments

Livestock Grazing Period[a]	Resting Period[a]	Purpose
Continuous grazing spring, summer, fall)	Winter, early spring	Range readiness turn-on in the spring would allow grazing to begin when rate of forage production is high and food reserves are building up from newly manufactured food. Food storage and seed production would increase, vigor of grass would improve. Rest in winter for improved vigor of browse. Rest in early spring to allow for forage production and food storage; would improve grass vigor. Graze in late spring and summer to provide high quality livestock forage. Graze regrowth in fall and winter for livestock forage and some seed trampling.
Rotational growing season deferment (spring, summer,	Winter and one spring; summer/ fall period each year	Range readiness turn-on would allow grazing to begin when rate of forage production is high and food reserves are building up from newly manufactured food. Food storage and seed year production would increase, vigor of grass would improve. Defer grazing in spring to allow for food manufacture, storage, and improved vigor. Defer to improve cover and litter accumulation. Defer grazing until after seed ripe to allow for seed production, maximum food storage and to promote seed establishment by trampling. Graze in spring to provide high quality forage for livestock. Rest in winter to improve vigor of browse. Graze in fall for livestock forage. Defer in the late fall to improve browse vigor.
No livestock grazing	Yearlong	Rest to improve vigor of all species (grass, forb, browse). Rest to improve cover and litter accumulation. Rest to allow for natural growth and reproductive processes, food storage, and seed production.

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[a] A more detailed description of proposed grazing and resting treatments is contained in Appendix 5. Acres of public land proposed for each of the above treatments is shown on table 1-8.

undesirable species. The increased forage would be 11,913 AUMs for livestock and 8,819 AUMs for deer. The stocking level for livestock would be increased as more forage becomes available. In the Randolph MFP, the acreage originally proposed for treatment was reduced to minimize conflicts with other resources (Appendix 3).

The proposed vegetation treatments would remove undesirable species by chemical spraying with a low volatile formulation of 2,4-D in a water carrier and/or prescribed burning. Desirable forage species for livestock and wildlife would be seeded, but seeded areas would require fencing to restrict livestock grazing for a minimum of two growing seasons.

Spraying would be proposed for ranges in good and fair livestock forage condition. These ranges have a sufficient amount of desirable forage species in the composition (at least 20 percent). Seeding success following treatment would be facilitated as the native forage plants benefited by spraying would promote desirable plant establishment. Burning would be proposed on poor condition ranges in order to adequately prepare a seed bed and encourage seeding establishment. These ranges typically lack desirable forage species (less than 20 percent) so establishment of desirable species is dependent on successful seeding establishment.

Once the seedings have become established, these areas would be grazed following grazing and resting treatments described in Appendix 5. The treated areas would be balanced in terms of forage productivity in several pastures within an allotment so that inequities in forage would not occur.

DESIGN RESTRICTIONS AND STANDARD OPERATION REQUIREMENTS FOR RANGE DEVELOPMENTS

During implementation of the proposal, environmental objectives would require the use of certain protective measures:

1. Procedures would be followed to maintain existing and proposed range developments. Each year, water developments would be inspected to ensure that they remain usable and to provide for needed maintenance. BLM would also solicit cooperative agreements with range users on range developments. These agreements would outline specific project maintenance responsibilities.

2. No permanent trails or roads would be constructed to project sites. Existing access would be used. Disturbance at all project sites would be held to an absolute minimum.

3. Where possible, water for wildlife would be maintained throughout the year at established watering facilities.

4. Disturbed areas would be reseeded as soon as possible with a mixture of native and/or introduced species in order to replace ground cover on the sites and to minimize losses of soil from wind and water erosion.

5. No clearing of the project sites would be allowed except on sites requiring excavation.

6. Allotments containing new seedings would not be grazed at a capacity that included the seedings until they were established and capable of supporting livestock grazing. A minimum of at least two growing seasons would be needed for seeding establishment.

7. Archaeological clearance (as specified in BLM Manual 8111.14) would be required for all project sites prior to new construction. In addition to assuring that archaeological values would not be impaired, this clearance would conform to the requirements of the Historical Preservation Act and Executive Order 11593. The memo of understanding between the State of Utah and BLM relating to this clearance is presented in Appendix 7.

8. Threatened and endangered species clearance would be required for all project sites prior to new construction.

9. A supplementary environmental assessment would be required prior to project construction. This assessment would be site specific and supplement the analysis contained in this ES.

Additional design restrictions specifically applicable to proposed range developments are summarized in Appendix 8.

MONITORING AND STUDY

In addition to development of AMPs, specific monitoring programs and studies are proposed to assure that range management objectives (table 1-3) are being achieved. This monitoring would begin with the initial action.

The proposed monitoring would evaluate changes in plant composition and ground cover after grazing treatments. Four primary studies would be basic to this evaluation: (1) actual grazing use, (2) vegetation utilization, (3) forage condition and trend, and (4) climate analyses (BLM Manual Section 4413.03). In addition, data on wildlife habitat, riparian vegetation, aquatic habitat, and watershed condition would be collected as necessary for each allotment. Key plant species (identified for each allotment and listed in Appendix 5) are of particular importance to this monitoring since livestock utilization rates would be restricted by proposed long-term management (see Evolution of Proposed Action, Appendix 3). The degree of livestock utilization on these species would be monitored in order to determine when livestock grazing would terminate. It is proposed that livestock grazing terminate once utilization has reached 50 percent of the current annaul growth on grasses and 60 percent on shrubs.

Data from these monitoring programs would be used to assess the effectiveness of current management and the need for any modifications.

If an evaluation determined that a specific allotment was not achieving its objectives, then modifications could include changes in the grazing treatments, livestock numbers, season of use, additional range developments, or any combination of these factors. Modifications would require preparation of an environmental assessment record or a supplement to this ES before significant changes could be made.

Administrative Options and Flexibility

Livestock forage condition, competition with wildlife, amount of available forage and water, and the time of year would also guide the BLM Area Manager in deciding when and where to move livestock in the event of drought or other temporary problems. Some of the manager's options would be as follows:

1. Authorize movement of livestock from one pasture to another sooner than scheduled, due to lack of forage in one pasture and availability in another.
2. Hold livestock on an allotment or in a pasture longer than scheduled, if utilization has not reached 60 percent. (Livestock utilization would not be allowed to exceed an average of 50 percent on grass and 60 percent on browse species.)
3. Reduce livestock numbers in the event of reduced forage production in any one season or growing year.
4. Increase livestock numbers in response to an unexpected abundance of forage in any particular year, authorized on a temporary basis determined yearly (43 CFR 4130.402).
5. Temporarily increase or decrease livestock numbers to achieve a predetermined degree of utilization. (For example, if achieving a degree of hedging on browse species is desirable to benefit wildlife habitat, a temporary increase in livestock numbers may be warranted.)

DEVELOPMENT AND MAINTENANCE COSTS

The District range management program would incur increased costs associated with implementation and management of the proposal. The range user would also have increased costs associated with maintenance of proposed range developments, such as fences, water, and water pipelines. The additional costs would occur primarily in the following areas:

1. Administrative costs of AMP development and on-the-ground management
2. Design and construction of proposed range developments, including vegetation treatments
3. Maintenance of range developments
4. Supervision of livestock use and the monitoring and evaluation of the proposals once they have been implemented

Construction of proposed range developments and completion of vegetation treatments would cost an estimated $851,709 (table 1-5). Annual maintenance costs each year would amount to an estimated $18,750 for the proposed new developments. Continued maintenance for existing range developments would also be required and would amount to an estimated $31,015 each year:

Fences	147 miles	29,440
Cattleguards	21 units	1,575
		$31,015

INTERRELATIONSHIPS

Federal and State agencies which have programs related to the proposed action include the Forest Service and Soil Conservation Service (U.S. Department of Agriculture), Bureau of Land Management, State of Wyoming, Environmental Protection Agency, Utah State Division of Lands, and the Utah Division of Wildlife Resources. Private land owners would also be affected. Some specific and important areas of involvement are cited below:

Forest Service

In general, the Forest Service has the same multiple use land management policies as BLM: long-term sustained use of the resource for public benefit. For this reason, management programs of the two agencies are similar and, to a degree, complementary. There are 38 BLM permittees with livestock operations in the planning unit who also graze on the adjacent Wasatch-Cache National Forest. Use of BLM and Forest Service land during spring, summer, and fall is an integral part of the operator's yearlong operation. Grazing on Federal areas releases private meadowlands for hay production used to feed livestock throughout winter and early spring months before public land forage becomes available. Thus, proposed adjustments in season of use and livestock numbers would relate to seasonal interdependence. As a result, although the Forest Service and BLM maintain separate range management programs, close coordination must occur between the permittees and both agencies.

Soil Conservation Service

Soil Conservation Service (SCS) efforts are primarily directed toward stabilization of the soil and watershed resources and increasing the productive capability of private land. In Rich County, SCS has ongoing ranch plans developed on private lands. These plans are joint ventures between SCS and individual ranchers and include grazing systems, brush treatment projects, fences, and water developments.

Ranchers in Bear Lake, East Woodruff, and Meachum Canyon Allotments have SCS ranch plans. Proposed changes in BLM grazing management and disposal of public lands in two allotments may influence these programs.

BLM, Wyoming

The BLM District Office in Rock Springs, Wyoming administers 29,185 acres of rangeland in the Crawford Mountains within Rich County as part of its Uinta Allotment. An interrelationship exists between the management programs and goals of the Bureau in Wyoming and those of Utah BLM.

The Utah portion of the Uinta Allotment area was included in the MFP for the Randolph Planning Unit and multiple use recommendations have been developed for all resource activities except range management. Impacts associated with resource management activities in Utah would influence the future range management program developed for this area by Wyoming. Of the 84 permittees grazing livestock on BLM ranges in Rich County, there are 12 who jointly graze BLM ranges in the Uinta Allotment.

Environmental Protection Agency (EPA)

Responsibilities of EPA under the Federal Water Pollution Control Act of 1972 (PL-92-500) include the control of pollution caused by runoff from agricultural activities, including livestock grazing. Section 208 of the act requires that procedures and methods be established to control such sources to the extent possible. BLM has a similar responsibility as outlined in the provisions of the Federal Land Policy and Management Act of 1976, Executive Orders 11988 and 11990, and BLM Instruction Memorandum No. 78-410 dated August 3, 1978 relating to riparian floodplain management. The objectives to improve vegetation density and plant composition as well as reduce erosion would help meet the responsibilities of both agencies concerning runoff from livestock activities. Also, the proposed aquatic/riparian habitat objectives (management to improve habitat condition) would be a complementary action.

Utah State Division of Lands

Most State-owned rangeland eligible for grazing is leased from this Division. Where the leased lands are located within or adjacent to BLM allotments and the permittee holds a current State lease, he may enter into an Exchange of Use Agreement with BLM for the State-lease lands. In these exchanges, the State land is managed under the same practices as public land. BLM establishes the amount of livestock forage available for use on these lands, which are usually isolated sections scattered throughout the allotments. There are 15,890 acres currently eligible for exchange of use (table 1-10); inclusion into the proposed management systems would not conflict with management goals. There are no BLM range developments proposed for these State lands.

TABLE 1-10

Summary of Exchange of Use

Allotment	Existing Exchange of Use Agreements	Eligible But Have No Exchange Authorized
Bear Lake	X	...
Big Creek	X	...
Meachum Canyon	X	...
Deseret	...	X
Dry Basin	X	...
Duck Creek	X	...
Eastman	...	X
East Woodruff	X	...
Kearl	...	X
Laketown	X	...
Middle Ridge	...	X
New Canyon	X	...
Rabbit Creek	...	X
Sage Creek	X	...
Sessions	...	X
South Woodruff	...	X
Stuart	NA	NA
Twin Peaks	X	...
Woodruff Pastures	X	...

NA = Not applicable

Utah Division of Wildlife Resources (UDWR)

This agency is responsible for the protection, management, and conservation of wildlife in Rich County, including those on public lands. The BLM planning system incorporates wildlife needs and their habitat requirements into multiple use considerations. Current deer demand is estimated to be 8,513 AUMs and future deer demands are estimated at 15,586 AUMs. Wildlife forage allocations have been included in the proposal and range developments have been designed to enhance wildlife uses. Since management activities of both agencies are closely related, continued coordination would be necessary, particularly in the areas of wildlife harvests, population studies, habitat management, and protection of threatened or endangered wildlife species. As an example, the future antelope introduction proposed by UDWR and provided for in the MFP would involve cooperation between UDWR and BLM. For the proposed introduction program to be successful, BLM must supply the forage on Federal ranges and UDWR must control the populations to maintain them within the carrying capacity of those ranges. Both agencies must jointly monitor the introduction in order to ensure management objectives are being met and are consistent with the multiple use plan for the Randolph Planning Unit. This proposed antelope introduction would result in an allocation of 372 AUMs on six allotments. Appendix 4 shows the allotments and AUMs involved with this proposed allocation.

Another interrelationship in management programs could exist between the two agencies. UDWR is considering a proposal to restock several suitable streams in Rich County with Utah cutthroat trout, a species once common in the area but now nonexistent. Stocking would probably take place in those stream reaches that are now in good condition. The success of the proposed stocking program would be dependent on BLM management and the condition of the fisheries habitat at the time of introduction.

Proposed forage allocations would provide sufficient deer AUMs to meet UDWR anticipated demand (Appendix 3).

Private Ranching Operations

The private holdings of many ranch units cannot supply the necessary forage for all seasons of the year; they must combine grazing on public land with forage produced on other lands to obtain the necessary supply of feed. The proposed action would reduce the time some permittees would be authorized to graze Federal ranges. This could require more extensive use of these private base holdings and possibly affect their operation on private ranges.

In addition, private lands owned or controlled by the permittee can also be offered for Exchange of Use Agreements, in which case BLM would determine the amount of livestock forage available in these areas in the same manner as the State-lease exchanges are handled. Of the 19 allotments, 18 have private and State land intermingled with public land and are eligible for exchange of use privileges. Eleven of these allotments currently have exchange of use authorized. Seven do not have exchange agreements. In most instances, any adjustments made in the amount of grazing allowed on these private exchange parcels would be influenced by a similar public land use adjustment made as a result of the proposed action. Table 1-10 summarizes the exchange of use situation.

Other BLM Programs

The Bureau of Land Management is responsible for all resource activities on public land in the ES area. The relationship of these programs with the proposal is described in Appendix 3, Evolution of the Proposed Action. The Bureau watershed and wildlife programs are most closely related to the proposal. For example, a wildlife interseeding project in Dry Basin Pastures and Woodruff Pastures Allotments required the proposal to be altered to allow 2 full years of rest and reduced AUMs available for livestock use.

CHAPTER 2

DESCRIPTION OF THE ENVIRONMENT

CHAPTER 2
DESCRIPTION OF THE ENVIRONMENT

INTRODUCTION

This chapter contains a description of the climate, air quality, geology, topography, soils, vegetation, water, wildlife, cultural/visual resources, land use, and socioeconomics as they presently exist in the Randolph ES area. The degree of detail in the description relates directly to the degree of anticipated effect on the resources by the proposed action and alternatives.

CLIMATE

The primary influences upon vegetative growth within the Randolph Planning Unit are the amount of precipitation, the temperature, and the length of growing season. Data from the Randolph URA Step 2 (July 7, 1977) and from Arlo Richardson, Utah State Climatologist, indicate that most of the precipitation in the planning unit occurs during the winter and spring months.

Precipitation variability within the unit is important. Annual precipitation ranges from 10 to 14 inches. Mountain slopes can receive even higher amounts. Summer rains are often torrential and of little agricultural value. For example, the average thunderstorm is less than 30 minutes in duration and drops up to 0.25 inch of rain (personal communication, Utah State Climatologist). Rapid runoff prevents significant absorption of the rainwater by the soil. Similarly, drought is common and sometimes quite severe. Such precipitation patterns mean that vegetation growth is dependent on moisture received in the winter and spring and that moisture availability and effectiveness are dependent on the vegetation holding the snow on the site.

Temperatures at Laketown have been recorded as low as -37° F and as high as 98° F. Temperatures at Woodruff have been recorded as low as -50° F and as high as 96° F.

The length of the growing season is related to temperature. Strong temperature inversions in the mountain valleys of the planning unit cause shorter growing seasons in the valley bottomlands. The growing season increases up to about 500 to 800 feet above the valley floor. Elevations higher than 500 to 800 feet generally experience shorter growing seasons. The growing season for specific plants at each location could vary considerably depending on the plant's temperature sensitivity, vigor, and other variables. The freeze-free period (temperatures above 32°F) for Woodruff is 57 days (June 27 through August 23; personal communication with Arlo Richardson, Utah State Climatologist).

AIR QUALITY

Rich County and the surrounding areas are generally free of manmade pollution sources. Air quality in the area appears good, although no air quality data are available.

GEOLOGY AND TOPOGRAPHY

The Randolph Planning Unit encompasses the mountain slopes, foothills, and valleys of Rich County. Underlying parent material consists of a thick layer of sedimentary rock (either Paleozoic or Mesozoic, Quarternary, or Tertiary Knight Conglomerate sedimentary rock).

The planning unit is generally gently rolling with steep inclines near the mountain ridges and slight inclines in the valley bottomlands. Table 2-1 describes topographic features in Rich County.

TABLE 2-1

Topographic Features of Rich County

Topographic Feature	Description	Dominant Uses/Importance
Mountains	5 to 70 percent slope 6,520 to 8,000 feet elevation	Grazing, wood products, water yield, wildlife habitat
Mountain foothills	2 to 60 percent slope 6,300 to 7,000 feet elevation	Nonirrigated cropland, range, wildlife habitat
Lake terraces	1 to 10 percent slope 6,300 to 6,600 feet elevation	Irrigated and nonirrigated crops, orchards, bush fruits
Poorly drained valley bottoms (low lake terraces)	Slope less than 3 percent - 6,300 feet elevation	Irrigated cropland, improved pasture
Well-drained valley bottoms (low lake terraces)	1 to 10 percent slope 6,300 to 6,400 feet elevation	Range, wildlife habitat
Poorly drained lakes, plains	Slopes less than 3 percent, 6,300 feet elevation	Native pasture, wildlife habitat

The planning unit is in the Bear River drainage basin. The two subbasins occurring in the unit are Bear River and Bear Lake. More information on the planning unit drainage pattern is contained in the Water Resources section of this chapter.

SOILS

Introduction

A soil survey of the ES area is currently being conducted by the Soil Conservation Service (SCS) under a cooperative agreement with BLM. The SCS has made approximately 10 percent of its preliminary field data available for use in this ES. Since the remaining data are not expected to be available until after the publication of the Randolph Draft Environmental Statement (DES), the soils informaion used in this ES is based upon the 10 percent preliminary data.

Soil Descriptions

Data collected by SCS have yielded some 50 different soil units and 35 soil associations. The soils described have been predominantly loams ranging from a fine sandy loam to a silty clay loam. Appendix 9 lists the soil associations and provides data on some of their important characteristics.

Along the west side of the Bear River above the floodplain there is a band of wind-deposited silts 1 to 3 miles wide. Soils immediately west of the Bear River floodplain receive 9 to 10 inches of precipitation. As a result, vegetation is sparse, these soils have low organic matter content and are calcareous throughout. Soils farther west receive 14 to 18 inches of precipitation, have moderate amounts of organic matter, and carbonates are leached from the top 1 to 3 feet. Sagebrush and grass is the dominant vegetation type in this area. Near the top of the Bear River Divide, precipitation ranges from 25 to 40 inches. Soils in this area have a high content of organic matter and are dominantly leached of carbonates for 5 feet or more. Conifer and aspen trees grow here with open patches of sagebrush and grass.

Limiting Soil Factors

The Upland Shallow Loam soils are less than 20 inches deep. This condition restricts the amount of soil moisture available for plants and limits use of artificial vegetation manipulation techniques.

Soils of the Alkali Bottoms contain a substantial amount of salt. Their high alkalinity restricts types of vegetation to those that can tolerate such conditions. These areas are also affected by a fluctuating water table, generally 20 to 40 inches deep during the plant growth season.

Steep slopes are another limiting factor to soils in the ES area. Generally, runoff is increased and soil depth is reduced as slope gradient increases. In addition, steep slopes impose restrictions on existing and potential uses. For example, slopes in excess of 50 percent are not suitable for livestock use according to suitability guidelines (Appendix 10). Steep terrain also restricts the type of vegetation treatment that may be applied to a particular area.

The number of stones or rocks in a soil profile also imposes restrictions primarily through its influence on mechanical equipment use. It also reduces the amount of water available for plant growth.

Soil Distribution

Complete soils distribution information is presently available for seven of the 19 allotments. Table 2-2 lists the seven allotments with soils distribution data. SCS data indicate that within these seven allotments, soils of the Upland Shallow Loam type are the most common, comprising 30 percent of all the soils to be found. Soils of the Upland Stony Loam type are the next most abundant (20 percent).

Soil Suitability

The individual soil mapping units identified by SCS have been grouped into what SCS refers to as range or woodland sites. Fifty soil mapping units are grouped into 13 standard SCS range or woodland sites. The name of the range or woodland site is given for the soil mapping units in Appendix 9. According to Mr. LuDene Campbell, SCS Soil Scientist (personal communication, Oct. 1978), the range or woodland sites noted in this document represent all of the types of sites expected to be encountered in the ES area except for a semidesert clay range site near Neponset Reservoir.

TABLE 2-2

Acres of Range Site by Allotment

Range Site	Bear Lake	Dry Basin	Kearl	Laketown	Stuart	Twin Peaks	Rabbit Creek
Upland Shallow Loam	661	17	176	1,948	45	747	1,025
High Mountain Loam (aspen)	.....	.....	366	11	.....	194	.....
Upland Gravelly Loam	480	.....	5	458	.....	421	693
Mountain Clay	.....	.....	9	20	.....	399	.....
Mountain Loam	7	.....	15	240	.....	.....	.....
Semidesert Loam	.....	1,343	.....	.....	655	204	.....
Upland Stony Loam	.....	1,045	522	527	.....	327	497
Semidesert Stony Loam	.....	359	.....	.....	342	.....	704
Upland Loam	50	17	.....	37	.....	.....	338
Mountain Stony Loam	.....	.....	90	.....	.....	.....	.....
TOTAL ACRES	1,198	2,781	1,183	3,241	1,042	2,292	3,257

Source: SCS Field Mapping Sheets

The soil units, as represented by their appropriate range or woodland sites, were evaluated for their suitability for seeding, stock pond construction, trenching, and mechanical equipment usage. The criteria used for evaluating a particular range site's suitability were obtained from the 7300 BLM Manual General Range Suitability Guides. In order to further define the BLM rating for seeding suitability, the SCS Interim Guide for Rating Soils According to Their Soil Suitability for Range Seeding 1974 was also used. Ratings derived from this guideline are shown as a probability for seeding success. The suitability ratings are of a general nature and cannot always be applied to an individual tract of land. They can, however, be applied to a general geographical area such as an allotment.

Table 2-3, Range Site Suitability Rating, provides a summary of the suitability evaluation discussed above.

Erosion Condition

Seven categories of surface features were evaluated to determine the present erosion condition class within representative sites throughout this area: soil movement, surface litter, surface rock, pedestalling, rills, flow pattern, and gullies. Five erosion condition classes were used to depict current erosion activity through a numerical value called a Soil Surface Factor (SSF): stable (SSF 0 to 20), slight (21 to 40), moderate (41 to 60), critical (61 to 80), and severe (91 to 100).

According to the data obtained, approximately 10 percent (14,282 acres) are classified as stable; 51 percent (71,239 acres) are classified as slight; 35 percent (49,746 acres) are classified as moderate; and 4 percent (3,827 acres) are critical. Table 2-4 and figure 2-1 show the present erosion condition classes by allotment. An overall erosion condition rating was given to each allotment based on the following standards:

1. Good. Seventy-five percent or more of the soil is in a slight or stable erosion class.

2. Fair. Fifty percent or more of the soil is in a slight or stable erosion class.

TABLE 2-3

Range Site Suitability Rating

Range Site	Seeding Success (SCS)	Seeding (BLM)	Trenching	Stock Ponds	Seed Drilling	Disc Plowing
Upland Shallow Loam	30% or less	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
High Mountain Loam (aspen)	50% or more	Suitable	Suitable	Marginally suitable	Marginally suitable	Marginally suitable
Upland Gravelly Loam	50% or more	Suitable	Suitable	Unsuitable	Suitable	Marginally suitable
Alkali Bottoms	Not rated	Unsuitable	Marginally suitable	Suitable	Suitable	Suitable
Mountain Clay	50% or more	Suitable	Marginally suitable	Marginally suitable	Marginally suitable	Marginally suitable
Mountain Gravelly Loam	Not rated	Suitable	Marginally suitable	Marginally suitable	Unsuitable	Unsuitable
Mountain Loam	50% or more	Suitable	Marginally suitable	Marginally suitable	Unsuitable	Unsuitable
Semidesert Loam[a]	70% or more	Marginally suitable	Suitable	Suitable	Suitable	Suitable
Upland Stony Loam	50% or more	Marginally suitable	Suitable	Marginally suitable	Suitable	Marginally suitable
Semidesert Stony Loam	50% or more	Marginally suitable	Marginally suitable	Marginally suitable	Marginally suitable	Marginally suitable
Mountain Stony Loam	30% or less	Unsuitable	Marginally suitable	Unsuitable	Marginally suitable	Unsuitable
Upland Loam	50% or more	Suitable	Suitable	Suitable	Suitable	Unsuitable
Woodland Type	Not rated	Suitable	Suitable	Marginally suitable	Unsuitable	Unsuitable

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[a] The SCS rating is different from the BLM rating. The SCS rating was utilized in the analysis because the SCS rating provides a risk factor.

TABLE 2-4

Public Land Acreage by Erosion Condition Class

Allotment	ACRES					
	Stable	Slight	Moderate	Critical	Not[a] Classified	Overall Rating[b]
Bear Lake	825	35	338	.....	.....	Fair
Big Creek	919	11,500	7,927	.....	.....	Fair
Deseret	......	3,592	10,885	591	489	Poor
Dry Basin	1,322	1,459	......	.....	.....	Good
Duck Creek	829	8,896	3,685	.....	.....	Fair
Eastman	547	1,138	1,124	596	.....	Poor
East Woodruff	......	778	1,389	.....	.....	Fair
Kearl	1,023	160	......	.....	.....	Good
Laketown	2,121	653	453	.....	14	Good
Meachum Canyon	357	112	1,472	.....	10	Poor
Middle Ridge	163	1,063	60	.....	.....	Good
New Canyon	3,819	16,774	8,295	1,777	.....	Fair
Rabbit Creek	1,482	1,775	......	.....	.....	Good
Sage Creek	......	8,463	1,297	.....	393	Good
Session	......	......	238	.....	.....	Fair
South Woodruff	......	601	2,691	863	96	Poor
Stuart	......	1,042	......	.....	.....	Good
Twin Peaks	875	1,267	150	.....	.....	Good
Woodruff Pastures	......	11,931	9,742	.....	202	Fair
TOTAL	14,282	71,239	49,746	3,827	1,204	

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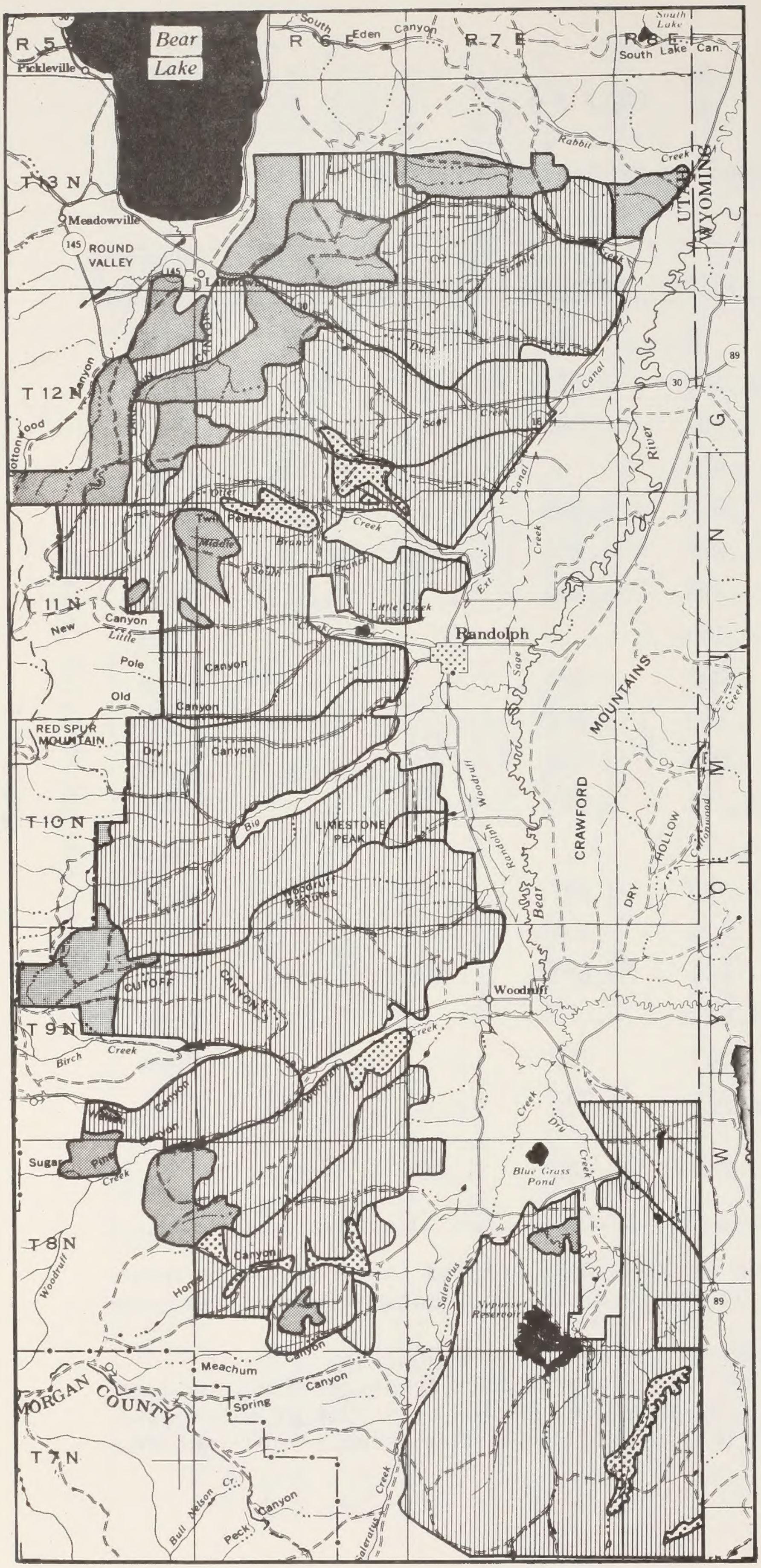
[a] An additional 565 acres of land was not included in the original inventory, but are assumed to be evenly distributed between the various erosion classes.

[b] The overall rating is based on the following standards:
Good = 75 percent of soil in either stable or slight erosion class.
Fair = 50 percent of soil in either stable or slight erosion class.
Poor = 49 percent or less of soil in either stable or slight erosion class.

RANDOLPH RANGE ES



LEGEND

▬ Allotment Boundary

▒ Stable

▥ Slight to Moderate

▩ Critical

FIGURE 2- 1

EROSION CONDITION CLASS

Source: Data adapted and generalized from BLM URA Erosion Condition Class Overlay.

3. Poor. Less than 50 percent of the soil is in a slight or stable erosion class.

Potential Erosion

Erosion trend was determined by making estimates of future SSF values that may be expected within the next 15 years if present land use and management practices are continued (Randolph URA). Erosion trend by allotment is shown in table 2-5.

From an allotment standpoint, 10 allotments would suffer a net decline in erosion condition, six allotments would improve, one allotment would not change and two others lack sufficient data for a projection.

Areas of Special Concern

Areas of critical erosion are comparatively small but they produce a significant amount of the total sediment lost from the allotments. Present sediment losses of up to 2.8 acre-feet per year per square mile are estimated for these areas. According to the Pacific Southwest Interagency Committee report on occular prediction of sediment yield, this is considered a high sediment yield. The average sediment loss for the entire Randolph Planning Unit has been estimated to be 0.54 acre-feet per year per square mile (Randolph URA). This is considered to be a moderate to low yield.

Specific areas of critical erosion shown on table 2-4 and figure 2-1 include: 863 acres of pinyon-juniper in the South Woodruff Allotment, 1,777 acres of sagebrush in the New Canyon Allotment, 596 acres of sagebrush in the Eastman Allotment, and 591 acres of sagebrush in the Deseret Allotment.

Another area of special concern involves streambank sloughing. Concentrated livestock and wildlife use along streamsides is causing the banks to break down and slide into the stream. Figure 2-2 illustrates this problem. Quantitative information relating to this problem is lacking. However, based on field observation, a significant amount of water-borne sediment is believed to be involved. Specific areas of concern are Laketown Canyon, Otter Creek, Randolph Creek, Big Creek, and Little Creek.

TABLE 2-5

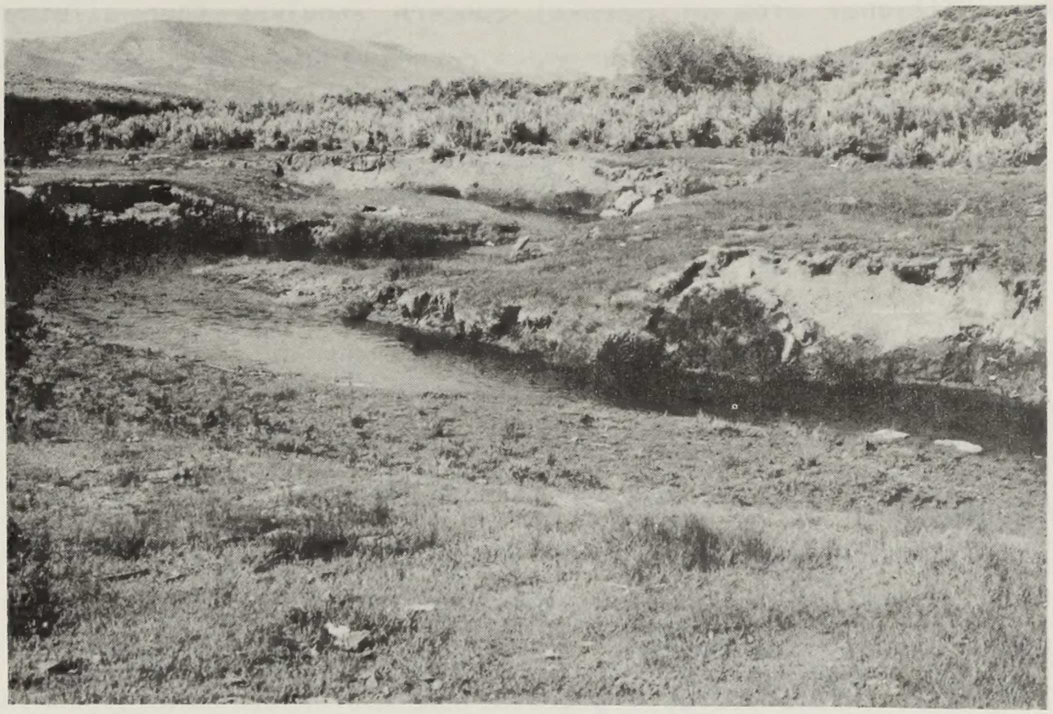
Erosion Trend by Allotment

	Erosion Trend (percent of allotment)				
Allotment	Declining	Static	Improving	Overall Percentage	
Bear Lake	40	40	20	Declining	20
Big Creek	44	56	...	Declining	44
Deseret[a]	19	72	9	Declining	10
Dry Basin	...	100	...	Static	...
Duck Creek	14	86	...	Declining	14
Eastman[a]	44	44	12	Declining	32
East Woodruff	...	67	33	Improving	33
Kearl	...	84	16	Improving	16
Laketown	...	60	40	Improving	40
Meachum Canyon	...	28	72	Improving	72
Middle Ridge	...	42	58	Improving	58
New Canyon[a]	27	60	13	Declining	14
Rabbit Creek	25	75	...	Declining	25
Sage Creek	...	71	29	Improving	29
Sessions	NA	NA	NA	NA	NA
South Woodruff[a]	39	39	22	Declining	17
Stuart	75	25	...	Declining	75
Twin Peaks	NA	NA	NA	NA	NA
Woodruff Pastures	32	68	...	Declining	32

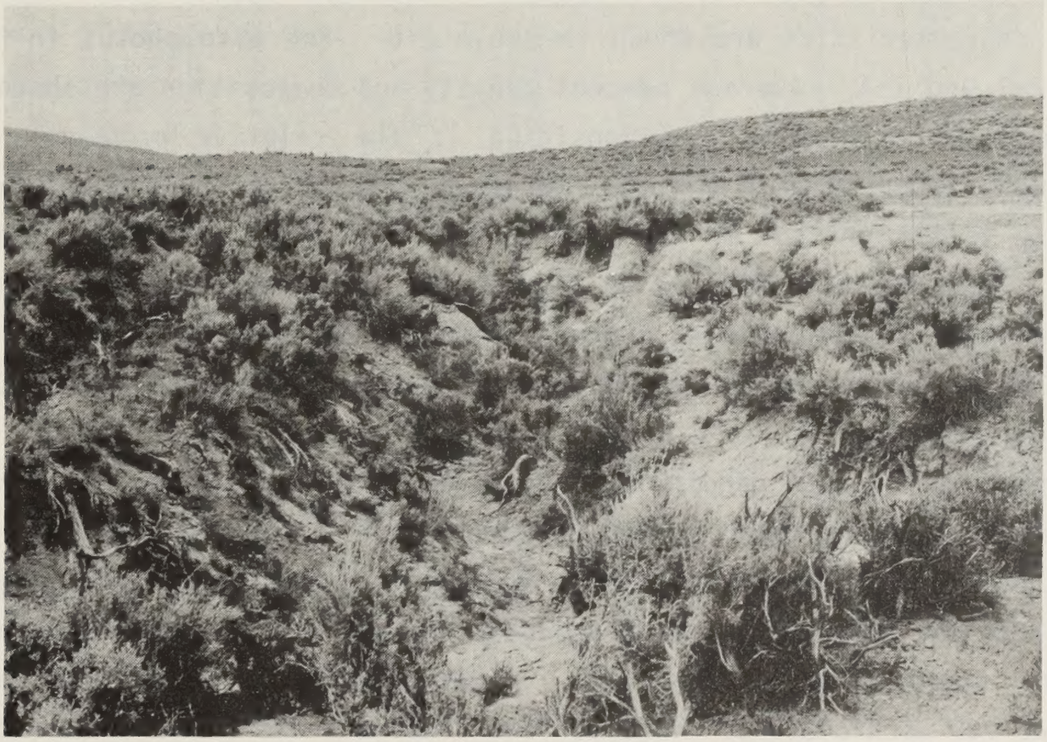
Source: Randolph URA *Soils*, 1977. BLM District Office, Salt Lake City.

NOTE: Includes all lands in the allotment.
NA = No data available.

[a] These allotments contain soils in critical erosion condition class.



EXAMPLE OF STREAMBANK SLOUGHING.
NOTE BANK ON RIGHT IS SLIPPING INTO STREAM.



GULLY CUT INTO A HILLSIDE

FIGURE 2–2

EROSION

An additional area of special concern involves four allotments having critical erosion condition and a downward trend in erosion condition of 25 percent or more as shown in table 2-5. Such trends indicate that present management practices are not meeting watershed management needs and erosion activities as shown in figure 2-2 may be occurring.

VEGETATION

Vegetation Types

The land surface of the Randolph Planning Unit supports a wide variety of plant species due to interactions between the soil types, elevation, aspect, temperature, precipitation, and past uses of the area. An area that supports vegetation and has one to several dominant species is identified as a vegetation type, usually named after the most dominant, abundant, or visible species. The major types identified and their characteristics are shown in table 2-6. See also photos in figures 2-3 and 2-4. Average percent density and composition are shown by allotment in table 2-7. Composition is the relative proportion of different plant types - forbs, grasses, shrubs - in a population. Density is the percent of the land surface area covered by live vegetation. These types are mapped on figure 2-5. For a detailed description of how this information was gathered, refer to Appendix 5.

The acres of vegetation types are shown by allotment in table 2-8.

Vegetation Condition

Livestock forage condition is the present system used by the Bureau of Land Management (BLM) to rate vegetation as good, fair, or poor in relation to its ability to provide desirable livestock forage (figures 2-6, 2-7, and 2-8). The system assesses the quality of vegetation based on the composition of desirable, intermediate, and least desirable species for each class of livestock and considers the current and recent past evidence of soil erosion.

TABLE 2-6

Vegetation Types

Broad Vegetation Type	BLM[a] Acres	Percent of Total	Soils[b]	MAJOR PLANT SPECIES		Percent Composition	Percent[c] Density for Type	Major Uses
				Common Name	Botanical Name			
Bunchgrass	12,779	9.1	5	Crested Wheatgrass	*Agropyron cristatum*	40	20	Nongame birds and mammals, ORVs, livestock, aesthetics
				Slender Wheatgrass	*Agropyron trachycaulum*	30		
				Western Wheatgrass	*Agropyron smithii*	10		
				Bluebunch Wheatgrass	*Agropyron spicatum*	5		
				Indian Ricegrass	*Oryzopis hymenoides*	5		
				Sandberg Bluegrass	*Poa sandbergii*	5		
				Rabbitbrush	*Chrysothamnus viscidiflorus*	5		
Dry Meadow	805	0.6	5	Kentucky Bluegrass	*Poa pratensis*	50	70	Small mammals and birds, ORVs, livestock, aesthetics
				Big Sagebrush	*Artemisia tridentata*	25		
				Sedge	*Carex sp.*	15		
				Sandberg Bluegrass	*Poa sandbergii*	10		
Big Sagebrush	91,335	65.1	1,3,5	Big Sagebrush	*Artemisia tridentata*	75	30	Sage grouse and big game, ORVs, hunting, livestock, aesthetics
				Rabbitbrush	*Chrysothamnus viscidiflorus*	10		
				Black Sagebrush	*Artemisia nova*	5		
				Western Wheatgrass	*Agropyron smithii*	5		
				Phlox	*Phlox hoodii*	5		
Black Sagebrush	7,522	5.4	2	Black Sagebrush	*Artemisia nova*	65	20	Sage grouse strutting, nongame birds, hunting, livestock, aesthetics
				Western Wheatgrass	*Agropyron smithii*	15		
				Slender Wheatgrass	*Agropyron trachycaulum*	10		
				Phlox	*Phlox hoodii*	10		
Mountain Shrub	1,472	1.0	1,3	Serviceberry	*Amelanchier alnifolia*	30	40	Big game, hunting, livestock, aesthetics
				Big Sagebrush	*Artemisia tridentata*	30		
				Snowberry	*Symphoricarpos oreophilus*	20		
				Bitterbrush	*Purshia tridentata*	15		
				Sandberg Bluegrass	*Poa sandbergii*	5		
Juniper	3,092	2.2	1,3	Juniper	*Juniperus osteosperma*	40	30	Big game, raptor and small bird nesting, hunting, aesthetics
				Big Sagebrush	*Artemisia tridentata*	35		
				Rabbitbrush	*Chrysothamnus viscidiflorus*	10		
				Bluebunch Wheatgrass	*Agropyron spicatum*	10		
				Phlox	*Phlox hoodii*	5		

[a] Based upon suitability for cattle only.

[b] Numbers refer to the following soil groups:

1. Well and somewhat excessively drained soils of the high mountains and mountains.
2. Well-drained soils of the mountain footslopes, loose-covered uplands and high lake terraces and fans.
3. Moderately well and somewhat excessively drained soils of the high and medium lake terraces and fans.
4. Somewhat poorly and poorly drained soils of the low lake terraces and valley bottoms.
5. Well to moderately well-drained soils of the low lake terraces; the poorly drained soils of the lake plains and the well-drained soils of the desert mountains.

[c] These are estimates of the average density of live vegetation and are not arrived at by measurement.

(continued)

TABLE 2-6 (concluded)

Broad Vegetation Type	BLM[a] Acres	Percent of Total	Soils[b]	MAJOR PLANT SPECIES Common Name	Botanical Name	Percent Composition	Percent[c] Density for Type	Major Uses
Aspen	4,057	2.9	1,3	Aspen	Populus tremuloides	60	65	Big game, raptors and nongame birds, hunting, livestock, aesthetics
				Snowberry	Symphoricarpos oreophilus	20		
				Mountain Brome	Bromus marginatus	10		
				Chokecherry	Prunus virginiana	5		
Timber	121	0.1	1	White Fir	Abies concolor	30	50	Raptor and small birds, hunting, hiking, aesthetics
				Douglas Fir	Pseudotsuga menziesii	30		
				Aspen	Populus tremuloides	30		
				Lodgepole Pine	Pinus contorta	10		
Unsuitable[d]	12,076	8.6	.....	....	....	...	...	Reptiles, raptor nesting, aesthetics
Riparian	1,031	0.7	5	Sedge	Carex sp	25	70	Waterfowl, shorebirds, amphibians, reptiles, fisheries, hunting, fishing, livestock, aesthetics
				Rush	Juncus sp.	23		
				Red-Top	Agrostis alba	23		
				Kentucky Bluegrass	Poa pratensis	18		
				Willow	Salix sp.	10		
				Currant	Ribes sp.	1		
Low Sagebrush	5,959	4.2	2	Low Sagebrush	Artemisia arbuscula	70	20	Sage grouse strutting grounds, nongame birds, hunting, livestock, aesthetics
				Black Sagebrush	Artemisia nova	15		
				Phlox	Phlox hoodii	5		
				Sunflower	Haplopappus sp.	5		
				Western Wheatgrass	Agropyron smithii	5		
TOTALS	140,298	100.0						

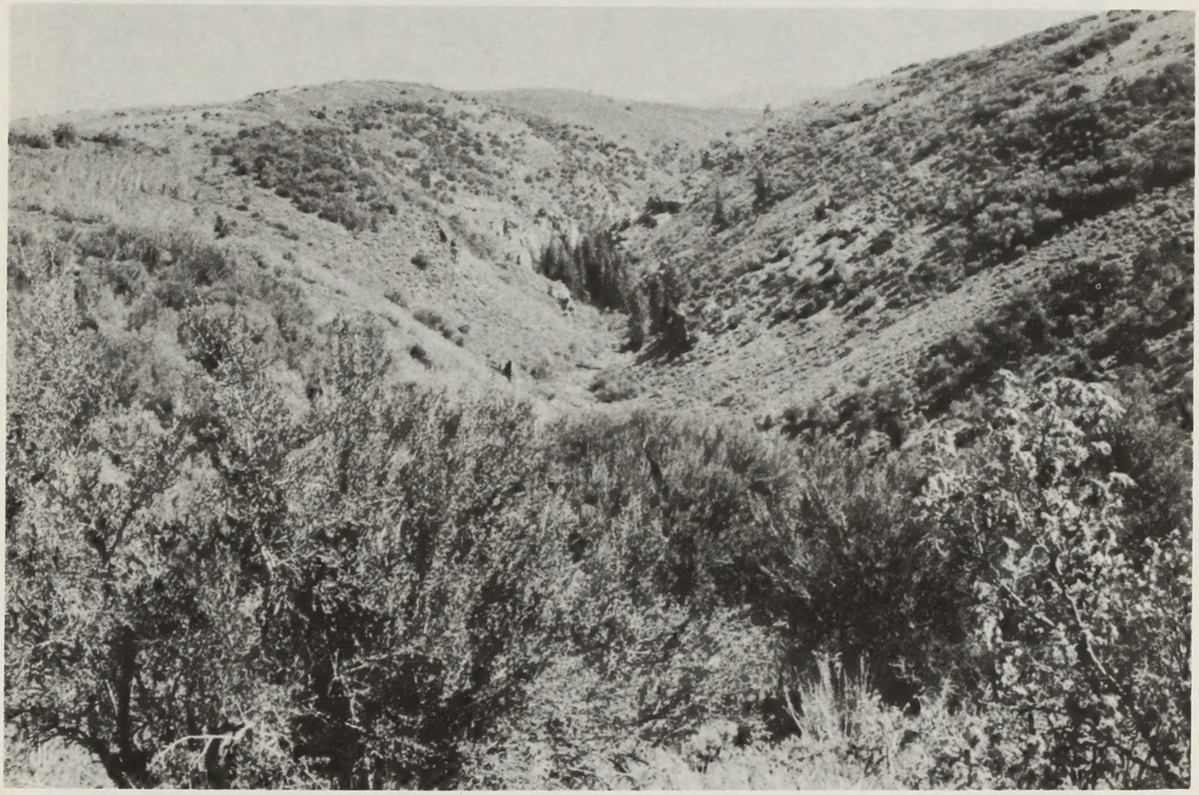
[a] Based upon suitability for cattle only.

[b] Numbers refer to the following soil groups:

1. Well and somewhat excessively drained soils of the high mountains and mountains.
2. Well-drained soils of the mountain footslopes, loose-covered uplands and high lake terraces and fans.
3. Moderately well and somewhat excessively drained soils of the high and medium lake terraces and fans.
4. Somewhat poorly and poorly drained soils of the low lake terraces and valley bottoms.
5. Well to moderately well-drained soils of the low lake terraces; the poorly drained soils of the lake plains and the well-drained soils of the desert mountains.

[c] These are estimates of the average density of live vegetation and are not arrived at by measurement.

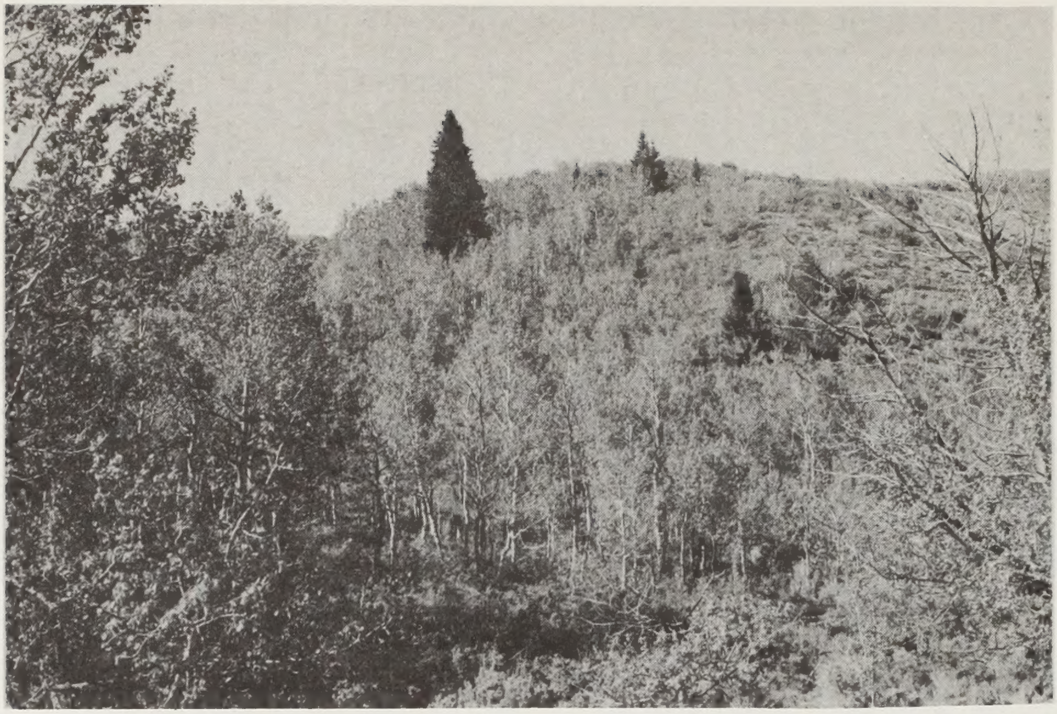
[d] This includes areas either barren, steep and rocky, or under water.



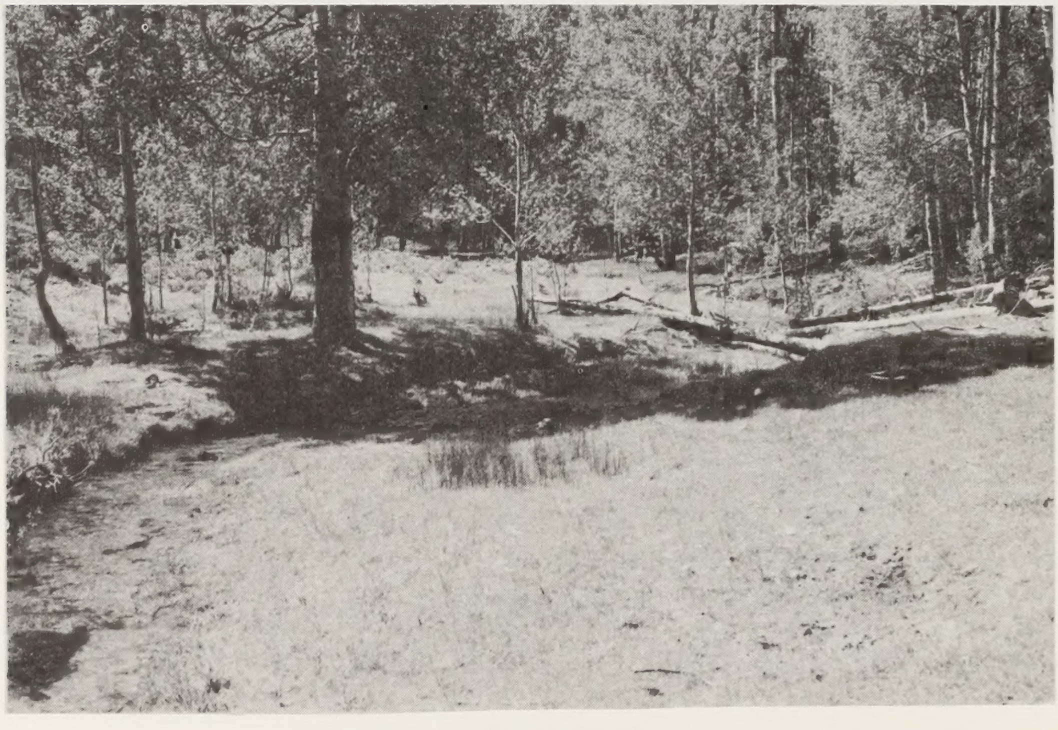
MOUNTAIN SHRUB TYPE IN FOREGROUND,
TIMBER TYPE IN BACKGROUND

FIGURE 2– 3

VEGETATION TYPES



ASPEN TYPE — NOTE DENSE GROWTH RESTRICTING LIVESTOCK MOVEMENT



ASPEN TYPE WITH INTERSPERSED DRY MEADOW

FIGURE 2—4

VEGETATION TYPES

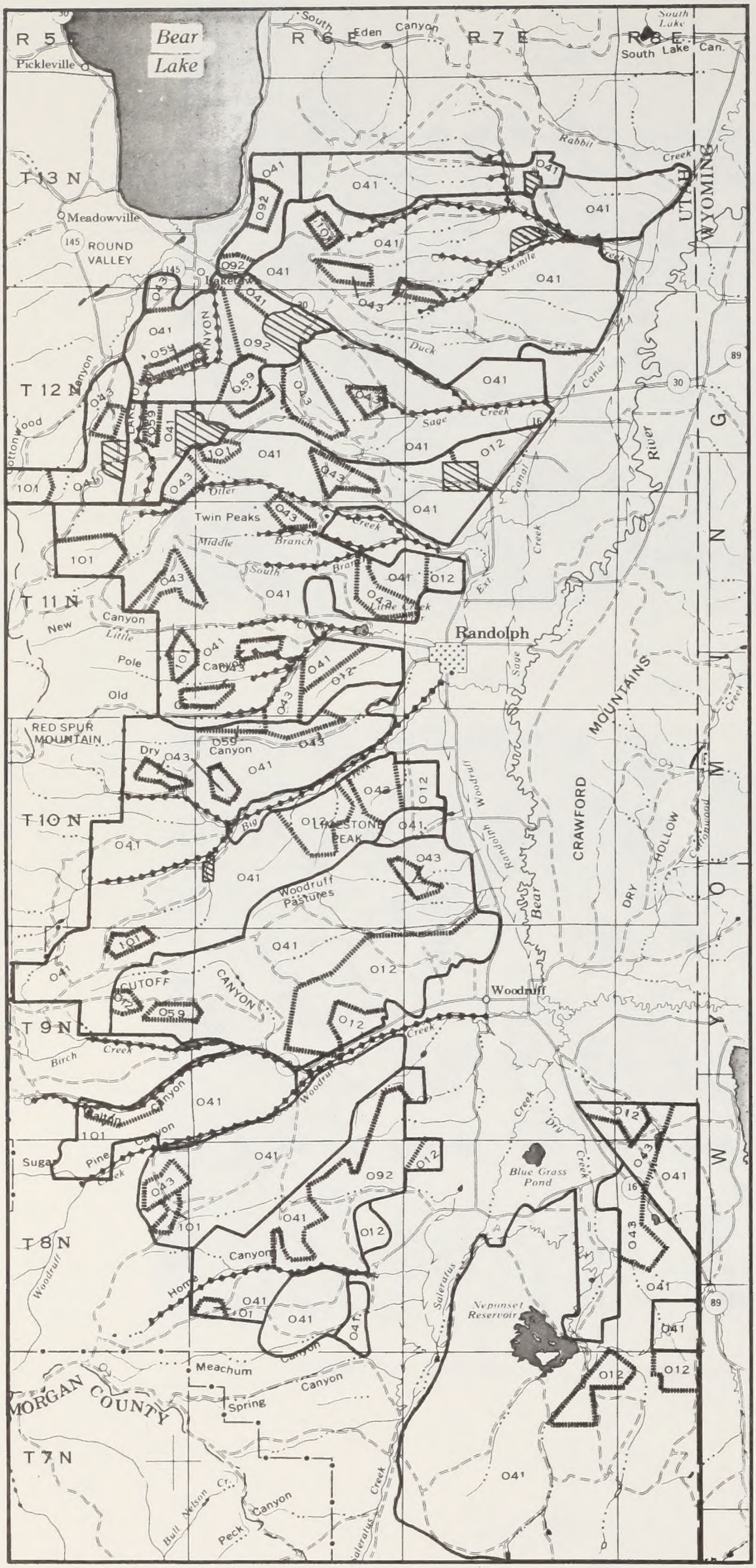
TABLE 2-7

Vegetation Composition and Density by Allotment

	PERCENT			
Allotment	Density	Grass	Forbs	Shrubs
Bear Lake	38	30	10	60
Big Creek	44	25	10	65
Deseret	31	42	8	50
Dry Basin	42	29	14	57
Duck Creek	44	15	11	74
Eastman	38	12	15	73
East Woodruff	29	46	10	44
Kearl	44	13	14	73
Laketown	43	15	10	75
Meachum Canyon	33	29	7	64
Middle Ridge	35	22	8	70
New Canyon	38	24	12	64
Rabbit Creek	37	24	10	66
Sage Creek	44	20	13	67
Session	26	7	6	87
South Woodruff	35	18	8	74
Stuart	29	12	13	75
Twin Peaks	52	31	7	62
Woodruff Pastures	29	35	10	55

NOTE: These figures are averages from the 1978 range survey vegetation writeups.

RANDOLPH RANGE ES



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SCALE IN MILES

LEGEND

- Allotment Boundary
- Vegetation Type
- Riparian Area
- ▨ Privately-owned Agricultural Lands

BLM Type Designation Numbers

012	Bunchgrass
041	Big Sagebrush
043	Black Sagebrush
059	Mountain Shrub
092	Juniper
101	Aspen

FIGURE 2- 5

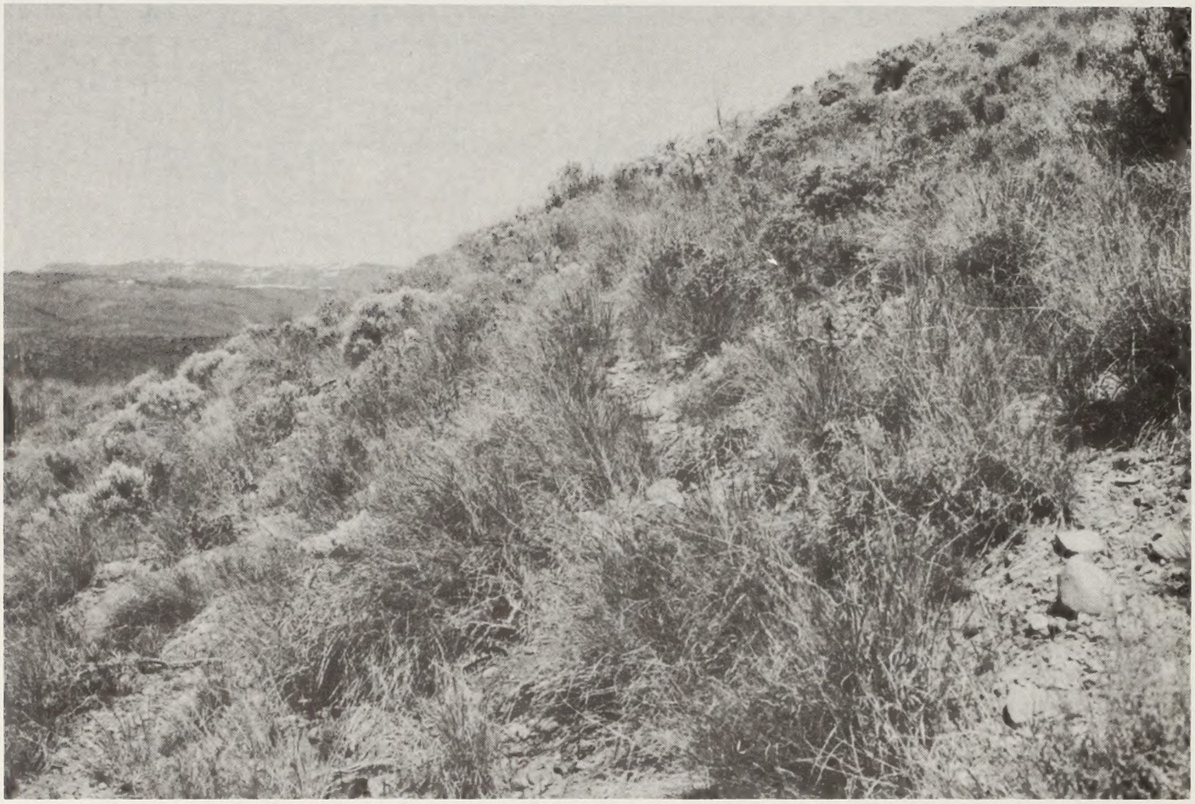
VEGETATION TYPES

TABLE 2-8

Major Vegetation Types by Allotment

Allotment	Bunchgrass	Dry Meadow	Big Sagebrush	Black Sagebrush	Mountain Shrub	Juniper	Aspen	Low Sagebrush	Timber	Unsuit-able[a]	Riparian	Totals
Bear Lake	0	0	662	5	150	321	0	0	0	60	0	1,198
Big Creek	744	332	15,070	855	204	53	298	0	42	2,597	151	20,346
Deseret	2,573	0	10,418	0	0	267	0	1,152	0	1,147	0	15,557
Dry Basin	0	0	2,715	0	0	0	0	0	0	66	0	2,781
Duck Creek	0	0	12,920	0	0	0	54	175	0	73	188	13,410
Eastman	0	0	3,152	75	0	0	14	90	0	64	10	3,405
East Woodruff	62	0	1,390	0	0	0	0	715	0	0	0	2,167
Kearl	0	0	479	42	0	0	545	117	0	0	0	1,183
Laketown	0	0	1,049	185	655	258	211	0	79	717	87	3,241
Meachum Canyon	350	0	1,480	0	0	0	0	0	0	121	0	1,951
Middle Ridge	0	0	1,218	0	0	0	40	0	0	0	28	1,286
New Canyon	3,840	473	14,320	4,245	311	0	2,467	2,859	0	1,793	357	30,665
Rabbit Creek	0	0	3,191	0	0	0	0	0	0	66	0	3,257
Sage Creek	0	0	7,923	204	0	0	0	851	0	1,072	103	10,153
Session	0	0	238	0	0	0	0	0	0	0	0	238
South Woodruff	0	0	2,303	0	2	1,541	5	0	0	352	48	4,251
Stuart	0	0	714	291	0	0	0	0	0	37	0	1,042
Twin Peaks	0	0	1,235	443	150	0	423	0	0	0	41	2,292
Woodruff Pastures	5,510	0	10,877	1,207	0	652	0	0	0	3,911	18	21,875
TOTALS	12,779	805	91,354	7,552	1,472	3,092	4,057	5,959	121	12,076	1,031	140,298

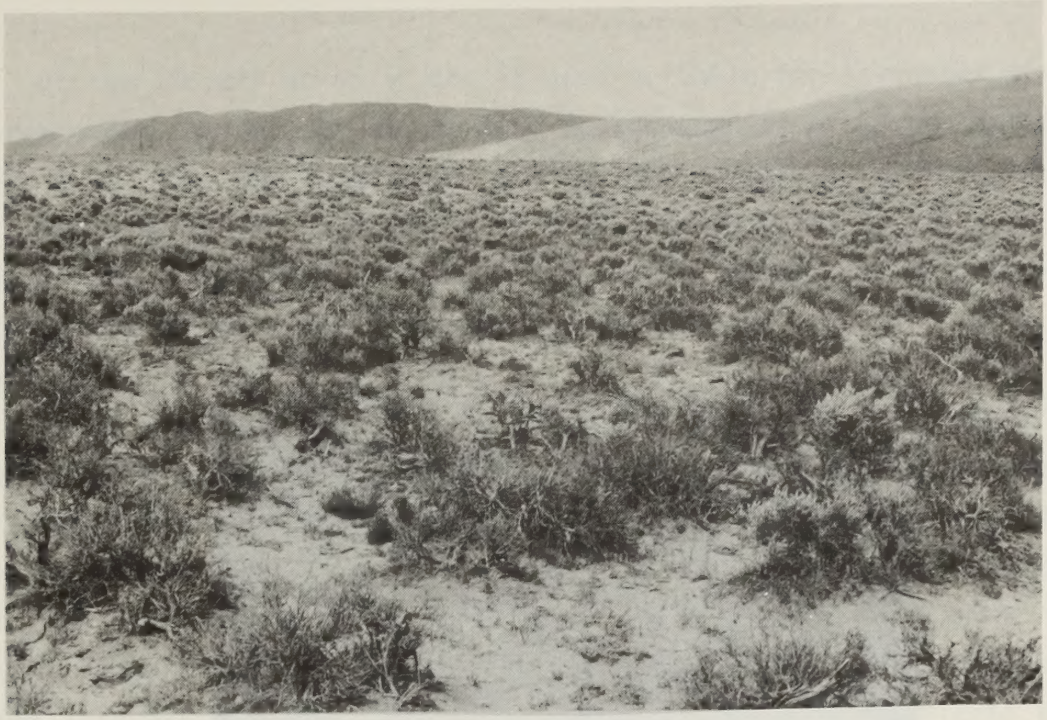
[a] BLM inventory procedures do not determine vegetation on unsuitable areas for livestock grazing. Unsuitability figures based on criteria for cattle suitability only. Methodology used to determine suitability explained in Appendix 10.



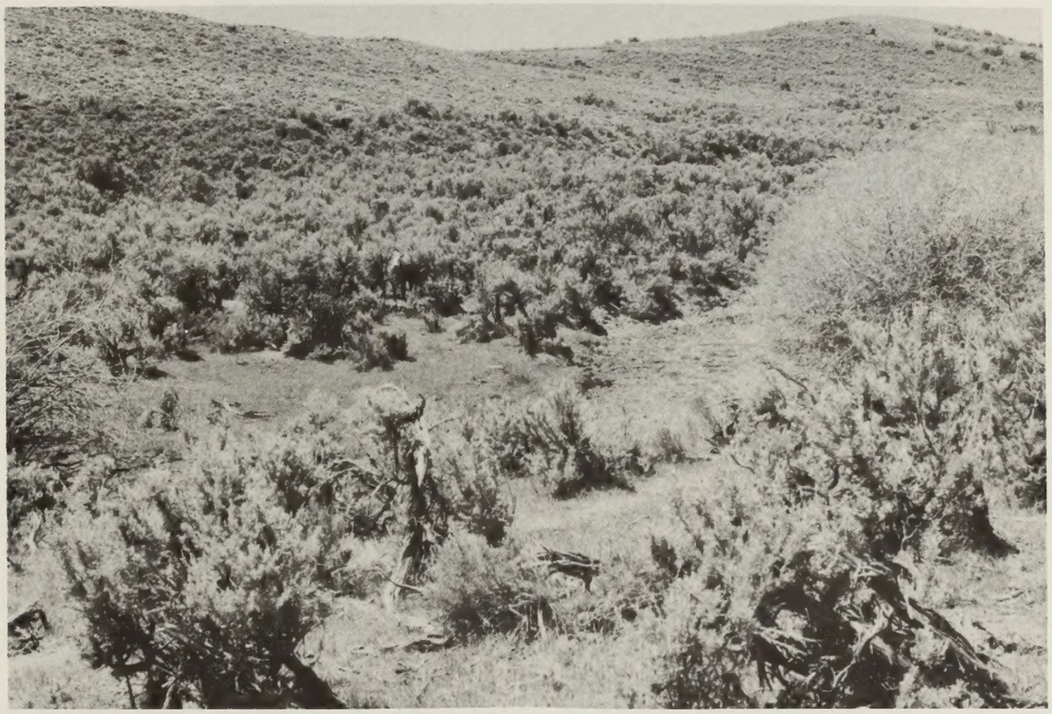
EXCELLENT CONDITION NATIVE VEGETATION—
NOTE VIGOROUS GROWTH OF BLUEBUNCH WHEATGRASS
AND LOW TOTAL COMPOSITION OF UNDESIRABLE SHRUBS

FIGURE 2–6

VEGETATION TYPES



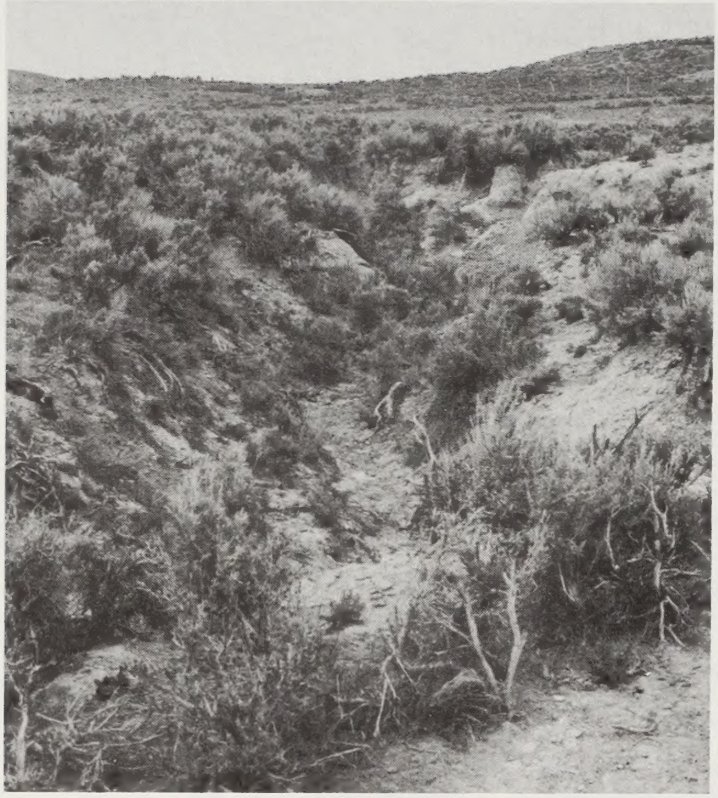
DEPLETED RANGE CONDITION – NOTE LACK OF DESIRABLE FORAGE SPECIES



DEPLETED SWALE – POTENTIAL OF THIS SITE TO PRODUCE LIVESTOCK FORAGE IS EVIDENCED BY THE VIGOROUS SAGEBRUSH GROWTH

FIGURE 2– 7

VEGETATION TYPES



DEPLETED BIG SAGEBRUSH RANGE – NOTE LACK OF
PERENNIAL GRASS AND OTHER DESIRABLE FORAGE SPECIES

FIGURE 2– 8

VEGETATION TYPES

Of the 128,222 acres in the ES area suitable for livestock grazing, approximately 41 percent are in good forage condition, 54 percent are in fair condition, and 5 percent are in poor condition (table 2-9). A detailed description of how this information was derived can be found in Appendix 5. In addition, table 2-10 lists values for the vigor and utilization of desirable livestock forage species.

Apparent Trend

Trend is a measurement to determine if the vegetation condition is improving or declining. This is accomplished by making measurements of the vegetation at different points in time, sufficiently separated to monitor vegetation change. Some photoplot study information is available for the Randolph Planning Unit. However, as these data are incomplete, "apparent" trend information was gathered for all areas. This trend information is referred to as apparent since it reflects only a one-point-in-time measurement of the vegetation, and not a series of observations spaced over a number of years. Trend information is important in that it indicates the direction in which the vegetation condition is moving, either "up", "static", or "down" (Appendix 11).

Apparent trend observations consider the vigor of desirable forage species, the quantity of new seedlings established by desirable forage species, the apparent movement of surface litter, and the degree of erosion apparent in terms of gully formation. Of the 128,222 acres suitable for livestock grazing in the ES area, approximately 8 percent are in an upward trend, 33 percent are in a downward trend, and 59 percent are static (table 2-11). A detailed description of how data were obtained is included in Appendix 5.

Utilization of Key Species

As pointed out in Stoddart (1975), "How much grazing individual plants can withstand is not known . . . , but certainly there are great differences among species in their grazing tolerance." Paulsen (1975) recommends utilization on perennial grasses be limited to from 30 to 45 percent of the available production to maintain plant health and provide soil protection. Clearly then, the maximum amount use a plant can physiologically withstand has not been firmly established.

TABLE 2-9

Livestock Forage Condition

	ACRES[a]							
	Good		Fair		Poor		Unsuit-[b]	
Allotment	Cattle	Sheep	Cattle	Sheep	Cattle	Sheep	able	Total
Bear Lake	667	1,138	471	0	0	0	60	1,198
Big Creek	6,718	13,404	10,927	4,345	104	0	2,597	20,346
Deseret	7,306	11,240	7,104	3,170	0	0	1,147	15,557
Dry Basin	2,715	2,715	0	0	0	0	66	2,781
Duck Creek	229	12,248	12,022	1,089	1,086	0	73	13,410
Eastman	142	2,603	1,823	738	1,376	0	64	3,405
East Woodruff	777	2,167	1,390	0	0	0	0	2,167
Kearl	558	1,183	625	0	0	0	0	1,183
Laketown	1,309	2,445	1,136	0	79	79	717	3,241
Meachum Canyon	383	1,604	1,447	226	0	0	121	1,951
Middle Ridge	0	1,286	993	0	293	0	0	1,286
New Canyon	18,813	28,872	9,860	0	199	0	1,793	30,665
Rabbit Creek	20	3,191	3,171	0	0	0	66	3,257
Sage Creek	1,055	9,081	8,026	0	0	0	1,072	10,153
Session	0	238	238	0	0	0	0	238
South Woodruff	101	1,106	2,625	2,640	1,173	153	352	4,251
Stuart	291	1,005	366	0	348	0	37	1,042
Twin Peaks	1,869	2,292	423	0	0	0	0	2,292
Woodruff Pastures	9,293	15,256	6,225	2,708	2,446	0	3,911	21,875
TOTAL	52,246	113,074	68,872	14,916	7,104	232	12,076	140,298

---

[a] Figures are for spring/summer/fall grazing season.

[b] Livestock forage condition was not evaluated for areas determined as unsuitable for livestock grazing. Appendix 10 contains a description of methodology for suitability determination. Unsuitability figures based upon criteria for cattle suitability only (Appendix 11).

TABLE 2-10

Existing Livestock Forage Vigor and Utilization Estimates

Allotment	Livestock Forage Vigor	Livestock Forage Utilization	Percent
Bear Lake	Fair	Moderate	59
Big Creek	Poor	Heavy	65
Deseret	Fair	Light	23
Dry Basin	Fair	Light	26
Duck Creek	Fair	Heavy	66
Eastman	Fair	Moderate	55
East Woodruff	Fair	Slight	19
Kearl	Fair	Moderate	54
Laketown	Good	Moderate	45
Meachum Canyon	Good	Slight	14
Middle Ridge	Good	Slight	12
New Canyon	Fair	Moderate	59
Rabbit Creek	Fair	Light	37
Sage Creek	Fair	Moderate	51
Session	Fair	Moderate	50
South Woodruff	Fair	Heavy	74
Stuart	Poor	Moderate	55
Twin Peaks	Fair	Light	30
Woodruff Pastures	Fair	Moderate	60

Source: Data for livestock forage vigor from apparent trend write-ups for 1976-1977 on file in the Salt Lake District Office, BLM. The numeric scores were translated into relative terms using the following scale:

Poor: 0 to 3.9 points
Fair: 4 to 6.9 points
Good: 7 to 10 points

For further explanation, see Appendix 11.

Data for livestock forage utilization from 1978 utilization survey, as updated, on file in the Salt Lake District Office, BLM. The numeric scores were translated into relative terms using the following scale:

Slight:	0 to 20 percent	Heavy:	61 to 80 percent
Light:	21 to 40 percent	Severe:	81 to 100 percent
Moderate:	41 to 60 percent		

TABLE 2-11

Apparent Trend of Vegetation

Allotment	Apparent Trend (acres) Up	 Static	 Down	Unsuitable[a] Acres	Total Acres
Bear Lake	662	155	321	60	1,198
Big Creek	0	10,256	7,493	2,597	20,346
Deseret	1,567	11,103	1,740	1,147	15,557
Dry Basin	0	2,715	0	66	2,781
Duck Creek	0	12,944	393	73	13,410
Eastman	547	579	2,215	64	3,405
East Woodruff	62	2,105	0	0	2,167
Kearl	543	640	0	0	1,183
Laketown	1,445	1,079	0	717	3,241
Meachum Canyon	812	1,018	0	121	1,951
Middle Ridge	1,178	108	0	0	1,286
New Canyon	973	6,656	4,243	1,793	30,665
Rabbit Creek	0	3,191	0	66	3,257
Sage Creek	1,071	8,010	0	1,072	10,153
Session	0	238	0	0	238
South Woodruff	5	2,220	1,674	352	4,251
Stuart	0	132	873	37	1,042
Twin Peaks	500	1,792	0	0	2,292
Woodruff Pastures	1,159	10,870	5,935	3,911	21,875
TOTAL ACRES	10,524	75,811	41,887	12,076	140,298

---

[a] Apparent trend observations were not made on areas determined as unsuitable for livestock grazing. Unsuitability figures are based upon criteria for cattle unsuitability only (Appendix 10).

Vegetation Production

Vegetation production information was gathered for the Randolph Planning Unit using the Ocular Reconnaissance Survey method. This survey method determines forage production on the basis of the quality and quantity of forage available to various classes of livestock and wildlife, and places production in terms of animal unit months (AUMs). A detailed description of survey methods is contained in Appendix 5. The results of the survey and the potential production are contained in table 1-4.

Vegetation production on any given site is determined by a number of factors including amount of precipitation and seasonal distribution, soil type, aspect, temperature, past use of the site, and plant phenology, which has a direct bearing on the design of grazing systems to accommodate management objectives. Phenology data for several plant species important to livestock and wildlife are shown on table 2-12.

TABLE 2-12

Plant Phenology - Randolph Planning Unit

Plant Species		Begin Growth	Flowering	Seed Ripe
Common Name	Botanical Name			
Crested Wheatgrass	*Agropyron cristatum*	4/1	5/20	6/20
Bluebunch Wheatgrass	*Agropyron spicatum*	4/10	5/15	7/10
Western Wheatgrass	*Agropyron smithii*	4/10	5/15	7/10
Junegrass	*Koeleria cristata*	5/1	6/15	7/1
Muttongrass	*Poa fendleriana*	4/5	5/24	6/20
Sandberg Bluegrass	*Poa sandbergii*	4/2	5/15	6/21
Needlegrass	*Stipa lettermanii*	5/18	6/20	7/1
Needle-and-thread	*Stipa comata*	5/24	6/15	7/5
Bitterbrush	*Purshia tridentata*	4/21	6/25	7/15
Big Sagebrush	*Artemisia tridentata*	4/3	7/1	9/15

NOTE: All dates are averages. Actual dates may be 1 to 2 weeks earlier on low elevation ranges, 1 to 2 weeks later on higher ranges.

Riparian Vegetation

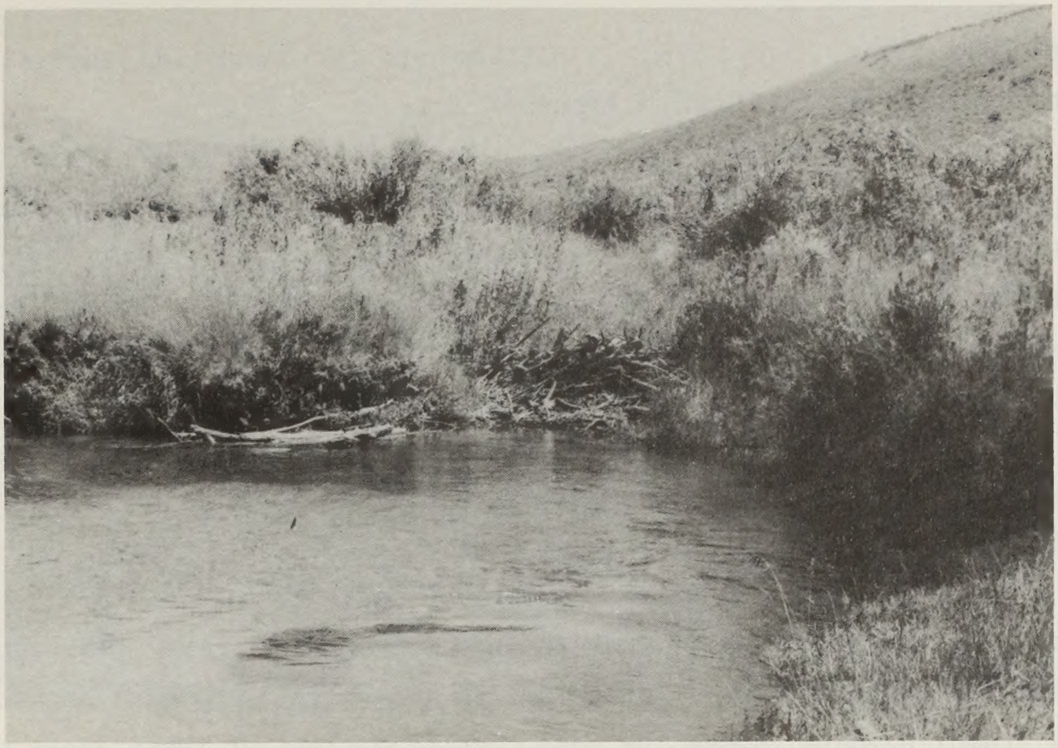
This vegetation type is characterized by a soil moisture regime that produces a community of mesic plants such as willows, sedges, and meadow grasses. Some of the more common species are:

Understory	Overstory (woody species)
Carex spp.	*Salix* spp.
Juncus spp.	*Ribes* sp.
Agrostis alba	
Poa pratensis	

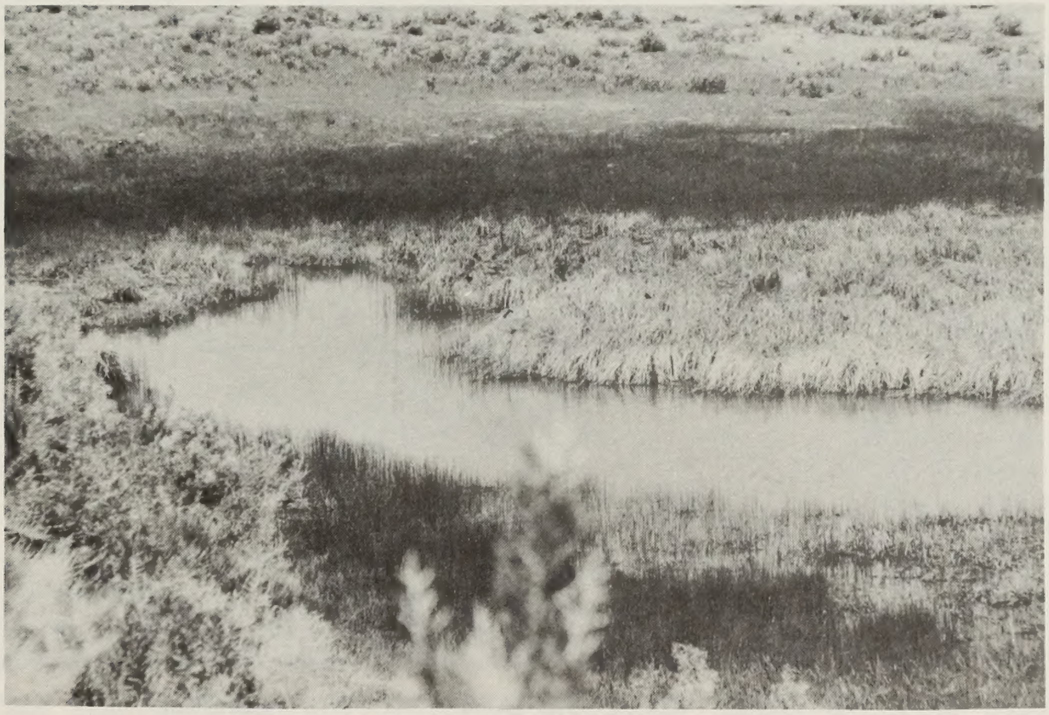
Riparian vegetation is found along stream courses (usually perennial), extending out laterally along the valley floor until plant roots can no longer reach the water table; this vegetation type also occurs in poorly drained basins that maintain a semi-permanent water table (i.e., wet meadows). Full expression of riparian vegetation is shown in figure 2-9, top photo, where willows (*Salix* spp.) dominate the overstory with a dense understory of sedges, grasses, and forbs. Wet meadow basins do not generally produce the woody overstory due to the more temporal nature of the water table (bottom photo, fig. 2-9).

The riparian type is the most productive within the planning unit and provides for the greatest number of uses. However, it comprises only 0.7 percent of public land in the ES area. A riparian area in good condition provides for watershed and stream stabilization, forage for livestock and wildlife, shade, structures for birds, water, cover for every major group of terrestrial wildlife, and physical cover and shade for fish.

There is presently no condition information available for riparian vegetation; however, it is assumed that the condition of riparian vegetation would be similar or correspond to the condition of fisheries habitat, since the same causitive agents are shared (see Fisheries section). These conclusions have been verified by field observation (personal communication, Cal McCluskey, BLM Wildlife Biologist, Salt



RIPARIAN – WILLOWS DOMINATE THE OVERSTORY



RIPARIAN – WET MEADOW BASIN – NO WILLOW OVERSTORY

FIGURE 2– 9

VEGETATION TYPES

Lake City, Utah, July 1978). Methodology for condition analysis of fisheries habitat is found in Appendix 12.

Riparian habitat provides 500 AUMs of livestock forage (2 percent of total AUMs within the ES area), but it is also utilized heavily by livestock for shade, water, and to some extent, a travel corridor. Livestock typically graze the lower ranges and follow the receding snowline to the upper elevations in search of green, succulent forage. Figures 2-10 and 2-11 illustrate good, fair, and poor condition classes; as the condition class goes from good to poor, a reduction of woody vegetation, widening of the stream, and more sloping banks are all visible.

Riparian areas have been traditional concentration areas for livestock due to abundant water, green forage, and cooler daytime temperatures. Overutilization of forage plants (willows to grasses) and streambank trampling have caused the poor condition class of these areas (BLM, URA 3 Range Management).

Threatened and Endangered Vegetation

A literature search did not identify any known occurrence in the Randolph ES area of any plants that have been listed or proposed as threatened or endangered (*Federal Register*, June 1978).

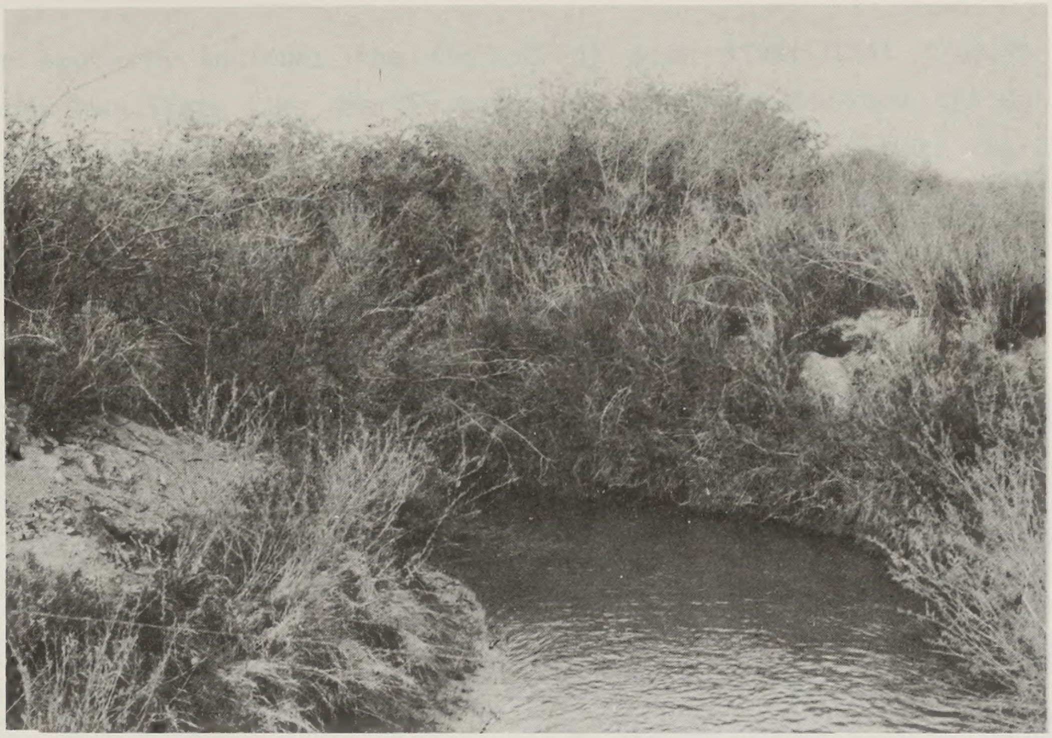
Poisonous Plants

No serious problems have been reported involving livestock and poisonous plants. Available information suggests the relative abundance of poisonous plants is low enough that it does not present a problem.

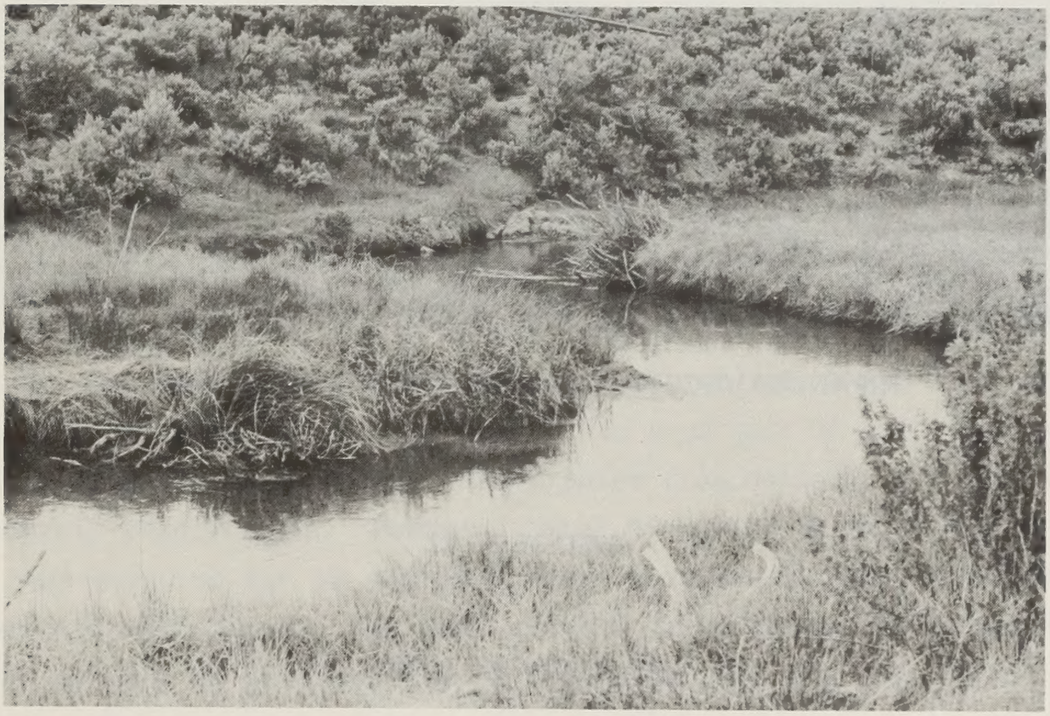
WATER

Supply

The Randolph Planning Unit is within the Bear River drainage which includes parts of Utah, Idaho and Wyoming. The planning unit has two subbasins within its boundaries, Bear River and Bear Lake. The Bear



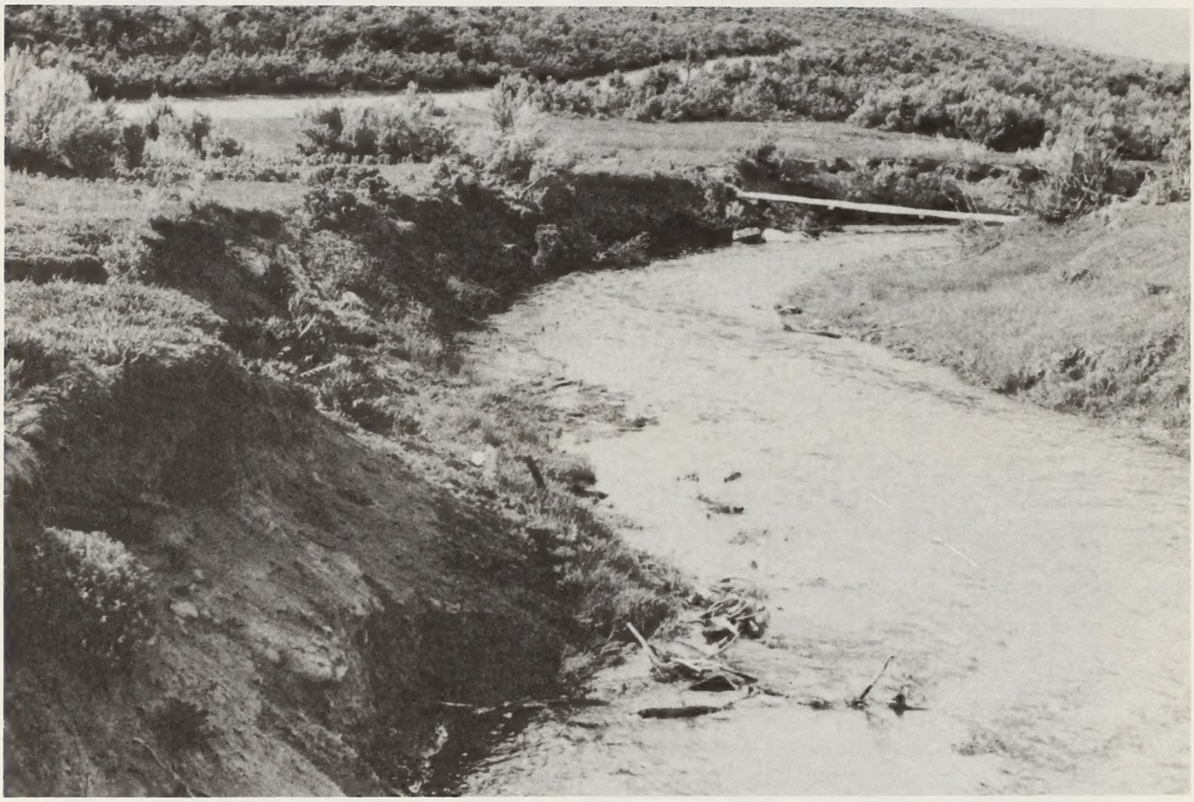
RIPARIAN VEGETATION – GOOD CONDITION CLASS



RIPARIAN VEGETATION – FAIR CONDITION CLASS

FIGURE 2–10

VEGETATION TYPES



RIPARIAN VEGETATION – POOR CONDITION CLASS

FIGURE 2–11

VEGETATION TYPES

River subbasin includes the portion of Bear River that crosses the Wyoming-Utah State line near Evanston, Wyoming, and meanders through the planning unit, reentering Wyoming and eventually emptying into the Great Salt Lake. Numerous tributaries enter the subbasin in the planning unit (fig. 2-12). The Bear Lake subbasin drains the remainder of the planning unit water into Bear Lake (fig. 2-12). Bear Lake water area totals 70,500 acres, of which 35,600 acres are in the planning unit.

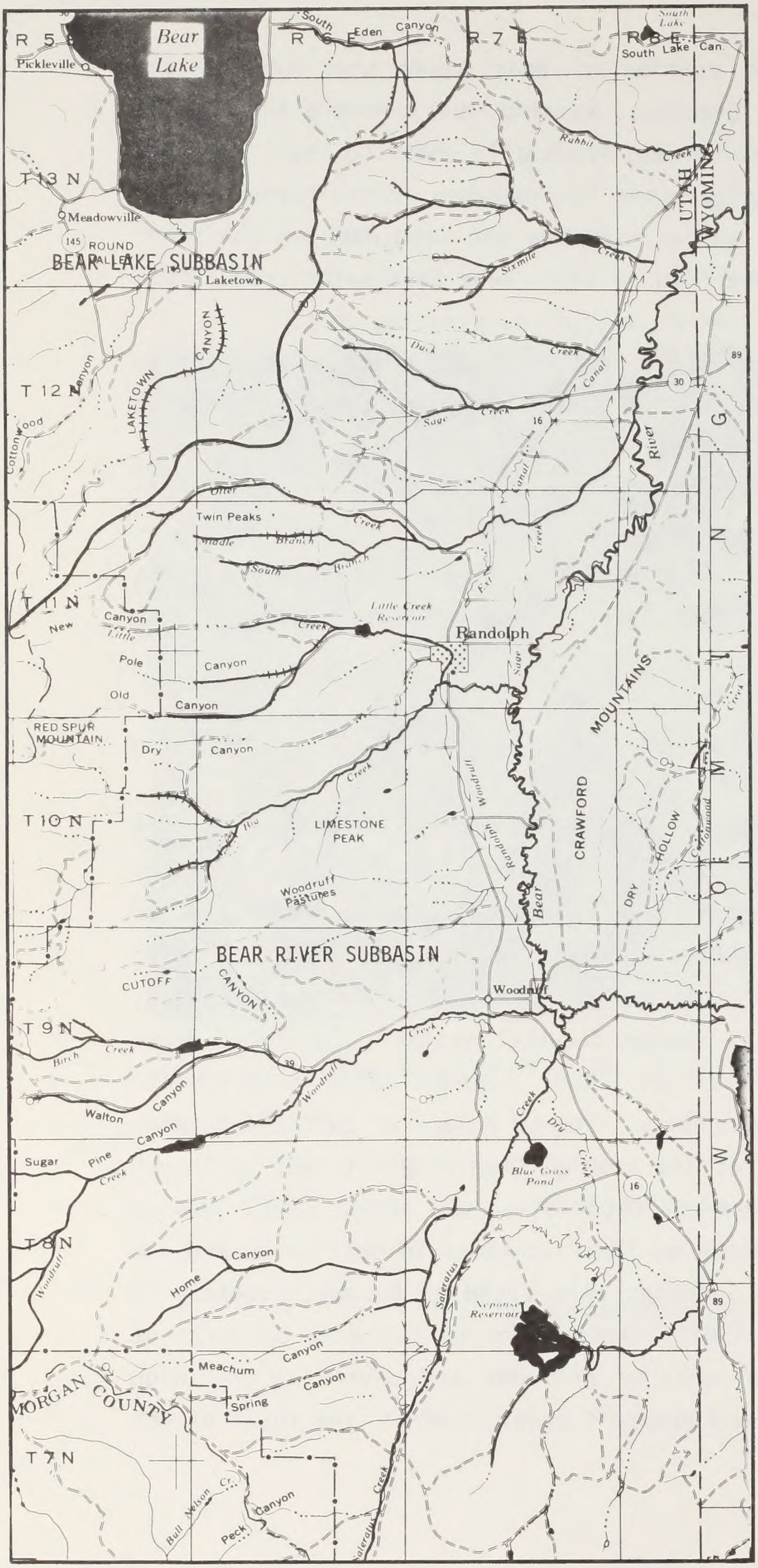
The basic source of water within the area is stream and spring flow originating from the mountain snow pack. These flows peak in the spring and diminish to low or zero in late summer and fall.

Information on ground water in the planning unit is meager. Information on amount, location, and known aquifer(s) is not presently available. Ground water in the planning unit occurs principally in the alluvial materials along the Bear River floodplain and stream and lake deposited sediment.

Quality

Proposed water quality standards for major surface water sources in Rich County are shown in table 2-13.

There are no known significant point source discharges in the subbasin. All water quality constituents are within the bounds as set for the proposed uses and standards as presented in table 2-13. Limited nonpoint source problems have been identified in the following categories: irrigated croplands and hay pastures, nonirrigated cropland, livestock grazing, individual sewage disposal systems, feedlots, urban runoff, and construction activities. Most problems occur from runoff, erosion, and irrigation return flows. Due to a lack of sufficient water quality data, the magnitude of the problem from nonpoint sources is not completely identifiable. However, total dissolved solids (TDS) loading has been measured for 10 months at four locations in Bear River and one location in Big Creek. The loadings were found to be approximately 50 to 65 percent of the load limits recommended by the Utah Division of Health. Major ground water quality problems are caused by the high water table in the Randolph and Woodruff area; however, the total effect



RANDOLPH RANGE ES

LEGEND

Watershed Subbasin Boundary
Streams
Reservoirs
Proposed Riparian Habitat Exclosures
Existing Big Creek Exclosure

FIGURE 2-12

SUBBASINS, WATERSHEDS, TRIBUTARIES

TABLE 2-13

Proposed Water Quality Standards for Rich County

Water Body	Domestic Source 1c	Recreation and Aesthetics 2a	Recreation and Aesthetics 2b	Aquatic-Wildlife 3a	Aquatic-Wildlife 3b	Aquatic-Wildlife 3c	Aquatic-Wildlife 3d	Agriculture 4
Bear Lake (Utah portion)	...	X	...	X	...	...	...	X
Birch Creek Reservoir	...	...	X	X	...	...	...	X
Little Creek Reservoir	...	...	X	X	...	...	...	X
Upper Woodruff Reservoir	...	...	X	X	...	...	...	X
Bear River and tributaries in Rich County	...	...	...	X	...	...	...	X

Source: Draft Waste Water Disposal Regulations, Part II "Standards for Water Quality for Waters of the State". State of Utah, Department of Social Services, Division of Health April 12, 1978.

NOTE: Reservoirs shown are 20 acres or larger.

Class 2a. Protected for recreational bathing (swimming).
Class 2b. Protected for boating, water skiing, and similar uses, excluding recreational bathing (swimming).
Class 3a. Protected for cold water species of game fish and other cold water aquatic life, including the necessary aquatic organisms in their food chain.
Class 4
Protected for agricultural uses, including irrigation of crops and stock watering.

on the ground water of this area is unknown due to the lack of water quality data. Septic tank permits for the area are issued on a case-by-case basis by the local health department (Draft Water Quality Management Plan, Randolph-Woodruff Subbasin, Bear River Basin, Utah, May 1978).

WILDLIFE

Introduction

The vegetation of each ecosystem is of primary importance to wildlife as it provides these life components:

--cover (e.g., pinyon-juniper for deer)
--food (e.g., grasses and forbs for rodents)
--water (e.g., succulence for lactating deer)
--space (e.g., "open" areas for sage grouse strutting)

Species such as deer, sage grouse, and other primarily herbivorous species have very definite relationships with vegetation and, consequently, a close relationship to the proposed action and alternatives, whereas carnivorous species such as bobcat, black bear, raptors, etc., have an indirect relationship to vegetation and changes thereof. To avoid needless bulk in this statement, only those species that would be significantly affected by the proposal or alternatives will be described. Key Habitat Components will be described for each species or group of species and extraneous background material will not be included.

Sage Grouse

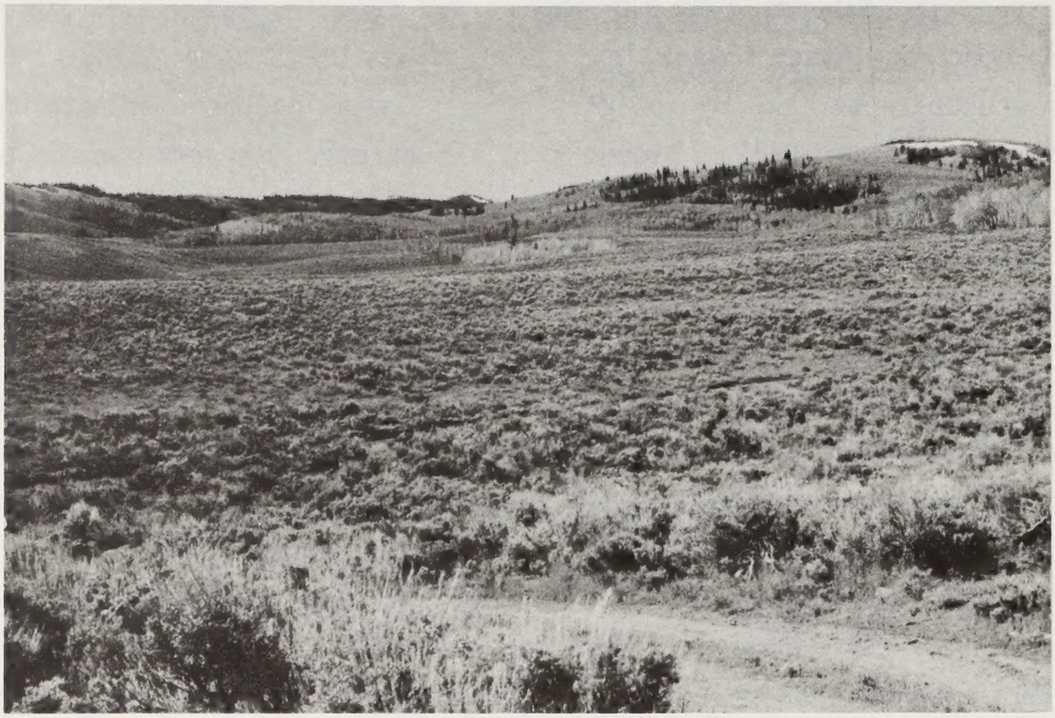
This is the most important upland game species found within the planning unit, both in terms of abundance and hunter preference. Rich County ranks second in the State for total sage grouse harvested in 1977 (personal communication Dwight Bunnel, UDWR Upland Game Specialist, Salt

Lake City, Utah, 1978). Although sage grouse are relatively abundant, existing populations appear to be stabilized below population levels of the recent past (personal communication, LaVon Thomas UDWR Conservation Officer, Randolph, Utah, 1978).

Strutting grounds form the hub of all breeding activities for sage grouse (extrapolated from Wiley, 1978; SCS, 1973; BLM, 1970). These areas are characterized by low-growing vegetation and an open appearance as shown in figure 2-13. Figure 2-14 illustrates the approximate location of all known strutting grounds within the planning unit.

Nesting and brood rearing areas lie in close association with the strutting grounds; studies in other areas indicate the majority, if not all, nesting activities occur within a 2-mile radius of strutting grounds (Western States Sage Grouse Committee, 1974). Identical conditions are assumed in the Randolph area. Cover for nesting is of prime importance; studies in other sage grouse areas indicate preferred nesting habitat includes: (1) a 20 to 30-percent canopy cover of 7 to 25 inches high sagebrush with (2) a grass-forb understory of 20 percent ground cover and forbs at 8 percent (BLM Manual, Technical Supplement 6601-3). Based on these criteria, sage grouse strutting and nesting habitats have been rated by allotment and the existing condition shown in table 2-14.

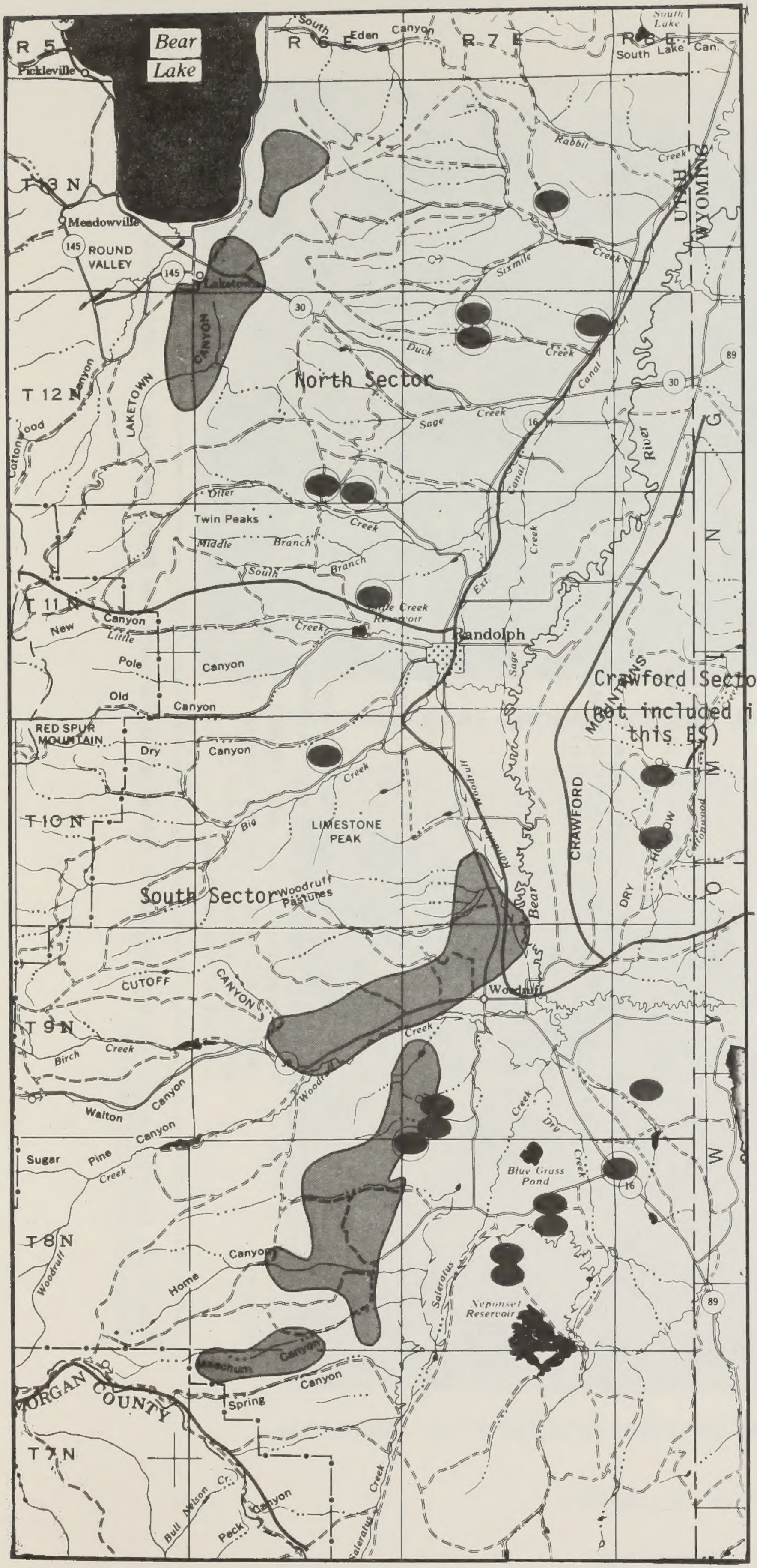
Brooding habitat includes the vicinity of the nesting habitat and mesic sites such as wet meadows and riparian areas (fig. 2-15). After the sage grouse clutches hatch, hens move their chicks to nearby meadow and riparian areas (Walstad, 1975; Savage, 1969). Young grouse feed almost entirely on insects for the first 4 weeks, then gradually change their dietary preference to succulent forbs (BLM Manual 6601-3; Braun, 1977). The meadow sites provide essential habitat for both insect and forb production. Studies by Savage (1969) found that young grouse diets were almost entirely of species restricted to meadow sites, further emphasizing the importance of these sites for sage grouse chick production.



LOW SAGEBRUSH TYPE — SAGE GROUSE STRUTTING AREA

FIGURE 2—13

WILDLIFE



LEGEND

—	DWR Deer Herd Unit Boundaries
▨	Critical Winter Ranges for Deer
●	Known sage grouse strutting grounds
◉	Strutting Grounds Located on Public Lands

FIGURE 2-14

SAGE GROUSE AND DEER HERD LOCATIONS
RANDOLPH PLANNING UNIT

TABLE 2-14

Wildlife Habitat Condition

	Condition Rating[a]			
Allotment	Acres of Critical Deer Winter Range		Number of Sage Grouse Breeding/Nesting Complexes	
Bear Lake	1,050	Good; excellent diversity and thermal cover; preferred species = 15 percent of composition	....	0
Big Creek	1,014	Poor; overutilization; thermal cover lacking; past single species seeding preferred species absent	Poor; overutilization of understory; low sagebrush/grass/forb density	1
Deseret	250	Poor; overutilization; thermal cover lacking; past single-species seeding preferred species absent	Poor; overutilizationof understory; low sagebrush/grass/forb density	4
Dry Basin	0	....	Fair; low grass/forb densities	1
Duck Creek	0	....	Fair; low grass/forb density	2
Eastman	550	Poor; excessive overutilization; preferred species ≤ 2 percent of composition	....	0
East Woodruff	0	....	Poor; low grass/forb density (crested wheatgrass seeding); overutilization	2
Laketown	894	Good; excellent diversity and thermal cover; preferred species = 25 percent of composition	....	0
Meachum Canyon	243	Poor; excessive overutilization; thermal cover lacking (past chaining) preferred species ≤ 2 percent of composition	....	0
New Canyon	0	....	Poor; overutilization; low grass/forb density	2
Rabbit Creek	0	....	....	0
Sage Creek		....	Fair; low grass/forb density	2
South Woodruff	1,952	Poor; excessive overutilization; preferred species ≤ 1 percent of composition	Fair; low sagebrush/grass/forb density	3
Stuart	930	Poor; excessive overutilization; poor thermal cover; preferred species absent	....	0
Woodruff Pastures	9,917	Poor; overutilization; poor thermal cover (past single species seeding and chaining); preferred species ≤ 2 percent of composition	....	0

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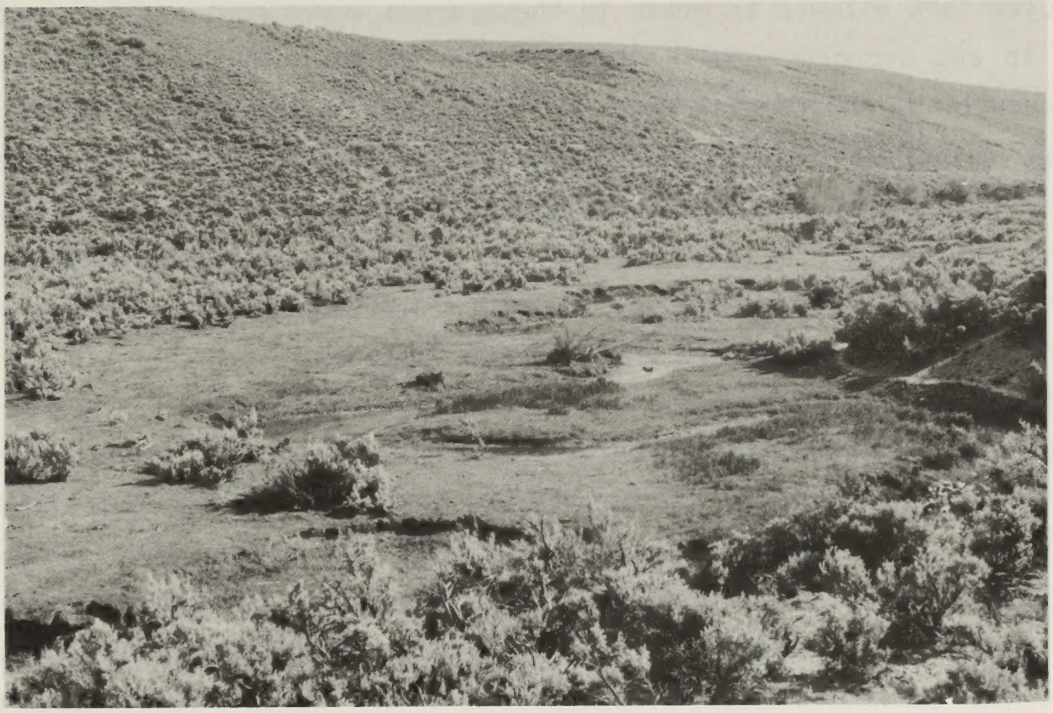
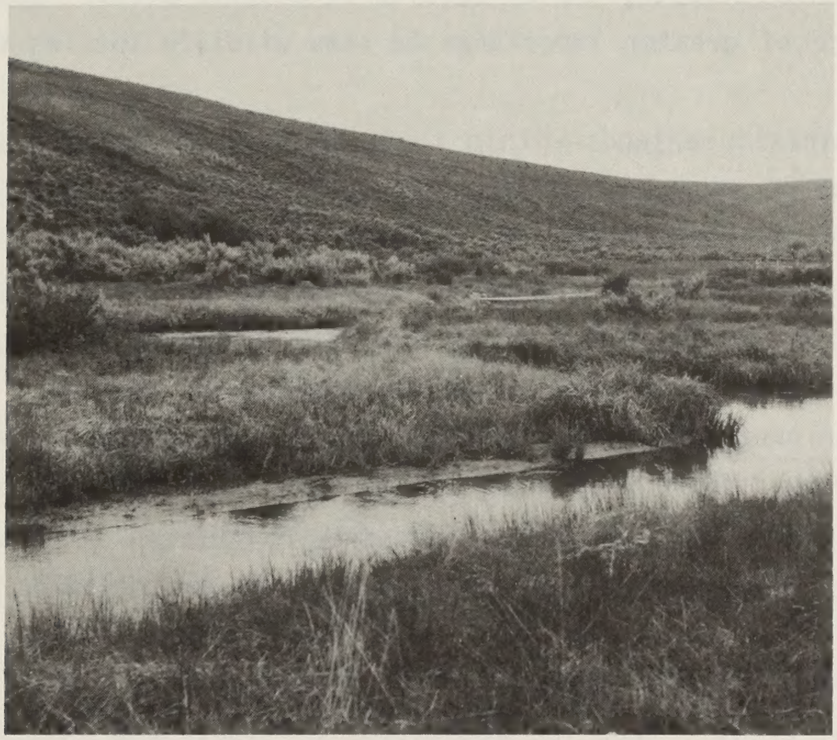
[a] Condition rating surveys were conducted by BLM wildlife personnel in 1978; the basis for ratings was primarily forage and cover (Appendix 13).



MEADOW — SAGE GROUSE NESTING AND BROOD AREA



MEADOW — SAGE GROUSE NESTING AND BROOD AREA

FIGURE 2— 15

WILDLIFE

Livestock allowed to graze in these areas would continue to concentrate in and overgraze these meadow sites (Hormay, 1976). Studies show that reductions in stocking rates do not reduce cattle concentrations or overuse in these areas (Hormay, 1976). Savage (1969) found that sage grouse avoid meadow and riparian areas where cover has been removed. Oakleaf (1971) reports that meadow areas must be protected from overgrazing by cattle for good sage grouse production. Table 2-15 shows the current condition of aquatic areas on public lands.

Riparian Areas

Based on research conducted by many wildlife experts, it is reasonable to assume that many species in the Randolph Planning Unit have a high degree of dependence on riparian areas for all or part of their life cycle. Based on URA Step 2 of wildlife species inventories, riparian areas in Rich County are considered to be important habitat for 103 out of 116 terrestrial bird species, nine out of nine snake species, eight out of eight amphibian species, 13 out of 15 mammalian carnivores, one out of three lizards, and 20 species of aquatic birds. Thus, riparian areas are of greater importance to some wildlife species than other habitats.

BLM-administered lands within the planning unit contain 35.5 miles (1,031 acres) of riparian habitat. Currently, only 0.5 mile (24 acres) within the Big Creek exclosure is in good condition, 8 miles (208 acres) are in fair condition, and 27 miles (823 acres) are in poor condition. The fair and poor condition ratings are the result of habitat degradation by livestock overgrazing (Fisheries Chapter 3).

Riparian areas are highly susceptible to overgrazing and overuse by cattle. Hormay (1976) states that cattle actively seek out the succulent vegetation of these areas and will remain there until the areas are grazed out. These conclusions are confirmed by Ames (1977). Further, cattle seek these areas for rest and cover. Overgrazing of riparian areas by cattle removes woody species (i.e., willows and shrubs) from stream areas, greatly reducing vegetation diversity and thus, available habitat for wildlife and avifauna.

TABLE 2-15

Condition of Aquatic Areas on Public Lands

Stream	MILES			Proposed Total Fencing (miles)[b]
	Good[a]	Fair[a]	Poor[a]	
Big Creek Exclosure	0.5	....	.....	....
Big Creek Outside Exclosure	...	0.5	2.0	....
Birch Creek	...	0.25	0.5	....
Home Creek	...	....	2.0	....
Laketown Canyon Creek[c]	...	1.0	4.5	2.25
Little Creek[c]	...	....	1.25	0.75
New Canyon Creek	...	....	1.0	....
Old Canyon Creek	...	0.75	1.0	....
Otter Creek (middle fork)[c]	...	....	1.75	0.75
Otter Creek (north fork)[c]	...	3.0	2.0	2.25
Otter Creek (south fork)[c]	...	....	0.75	....
Randolph Creek	...	1.25	1.75	1.75
Sage Creek	...	0.5	1.5	....
Sage Creek (north fork)	...	....	2.0	....
Six-mile Creek (north fork)	...	....	0.25	....
Six-mile Creek (south fork)	...	....	3.25	....
Spring Creek[c]	...	....	0.5	0.25
Walton Creek	...	0.5	1.0	....
Woodruff Creek	...	0.25	.....	....
TOTAL	0.5	8.0	27.0	8.0

Source: Wiche, 1975.

[a] Condition classes described in Appendix 14 and shown in figures 2-11, 2-12.

[b] Proposed for fencing and livestock exclusion in Randolph MFP (table 1-2).

[c] Portions of these creeks contain habitat suitable for Bonneville (Utah) cutthroat trout reintroduction (Chapter 1, Interrelationships section).

Deer

The planning unit is divided into two sectors (northern and southern) for deer number analysis (fig. 2-14). Current and future deer numbers are estimated by Utah DWR as follows:

Northern Sector	5,100	current population estimate
	8,000	future population estimate
Southern Sector	9,000	current population estimate
	16,000	future population estimate

Current and future deer AUM demands by allotment are presented in table 2-16.

It should be noted that current numbers are below population highs of the 1960s (URA 3 Wildlife).

Mule deer within the planning unit spend the summer months on the higher elevation Forest Service and BLM ranges. As the weather cools, the deer migrate slowly to the lower and warmer ranges. When the winter intensifies, the deer concentrate in areas called critical deer winter ranges. In the spring, the deer again migrate to the higher elevations following the receding snowlines (BLM Tech. Supp. 660-6).

Generally, the 123,498 acres of seasonal ranges (defined as spring, summer, and fall deer habitat) are estimated to be in fair condition, but these habitat ratings may be inaccurate from the lack of accurate survey data. Good condition seasonal (spring and summer) ranges with abundant forbs and grass and abundant preferred browse on fall and winter ranges are necessary for healthy, productive deer herds (Robinette et al., 1952; Julander et al., 1961; BLM Tech Supp. 6601-6).

Public lands account for 42 percent (16,800 acres) of all critical deer winter range within the planning unit. This represents 80 percent of the critical deer winter range for the southern herd unit and 10 percent for the northern herd unit (fig. 2-14). The carrying capacities of the critical deer winter ranges control the deer winter survival rate and, therefore, the deer herd size (Robinette et al., 1952; Stoddart and

TABLE 2-16

Current and Future Deer AUM Demands

Allotment	Current Demand Seasonal	Current Demand Critical Deer Winter Range	Future Demand Seasonal	Future Demand Critical Deer Winter Range
Bear Lake	.....	184	......	217
Big Creek	969	125	1,646	227
Deseret	.....	738	......	68
Dry Basin	134	.....	564	.....
Duck Creek	522	.....	678	.....
Eastman	156	68	330	150
East Woodruff	125	.....	518	.....
Kearl	55	.....	235	.....
Laketown	112	117	188	184
Meachum Canyon	87	30	186	67
Middle Ridge	59	.....	251	.....
New Canyon	1,556	.....	2,622	.....
Rabbit Creek	156	.....	395	.....
Sage Creek	388	.....	1,254	.....
Session	14	.....	40	.....
South Woodruff	190	297	414	646
Stuart	.....	115	......	255
Twin Peaks	87	.....	461	.....
Woodruff Pastures	1,007	1,222	1,286	2,704
TOTALS	5,617	2,896	11,068	4,518

Rasmussen, 1945). Robinette and Julander et al., (1952) found that deer winter survival is inversely proportional to the amount of available quality browse. Critical deer winter ranges have 13 percent in good condition and 87 percent in poor condition (table 2-14).

Both forage and thermal cover above 4 feet in height are critical elements for deer during severe winters. Table 2-14 shows the current condition of these ranges according to forage and cover availability. Based on the 1978 survey by BLM personnel, overutilization of key forage species by deer and domestic livestock and past rehabilitation projects such as chainings and single species seedings are responsible for most of the poor condition rating by reducing forage and removing critical cover.

Other Large Mammals

Elk, moose, black bear, and mountain lions visit BLM public lands in Rich County only infrequently.

These species are currently found on Forest Service lands and the adjacent private lands.

Small Mammals

Numerous small mammals are found within the planning unit (approximately 56 species). Two major life forms are represented by these small mammals: (1) small herbivores (rabbits, hares, ground squirrels, etc.), and (2) carnivores (bobcat, skunk, badger, etc.).

Rabbits and hares are found throughout Rich County. At present, numbers are below highs of recent years and the downward trend seems to be continuing (BLM, URA 3 Wildlife). Number estimates are not available at present due to a lack of studies in the area. Major habitat components in relation to the proposal or alternatives are food and cover, specifically, grasses and forbs.

Uinta ground squirrels are apparently at a population high. Severe forage competition is suspected between this species and livestock in riparian areas, due to the overgrazed condition of these areas (personal communication, Cal McCluskey, BLM Wildlife Biologist, Salt Lake City, Utah, 1978).

Threatened and Endangered Species

The endangered peregrine falcon and bald eagle are known to occur within the planning unit. These species are migrants and are mainly restricted to Bear River Valley and the Bear Lake area.

The endangered black-footed ferret and whooping crane could occur in the planning unit. The black-footed ferret is found only in conjunction with prairie dog colonies and such colonies exist throughout the planning unit. To date, no confirmed sightings have been made; however, unconfirmed sightings were reported in 1977 (BLM URA Step 3, Wildlife). The whooping crane has not been recorded in Rich County, but the Bear River is in the flyway used by "foster parent" sand hill cranes from the Idaho Gray's Lake National Wildlife Refuge north of Rich County (URA 3, Wildlife). The golden eagle is also present throughout the county. Although it is protected, it does not have endangered or threatened status.

The west front of the Crawford Mountains is being considered as nesting habitat for potential introduction of peregrine falcons. This locale is outside of the area of the proposal (fig. 2-14); however, if peregrine falcons are introduced in this location, they would probably utilize part of the planning unit as hunting territory.

FISHERIES

There are 19 streams (table 2-17) in the Randolph ES area that flow for a total of 35.5 miles on public land (BLM, URA 3 Fisheries). These streams typically flow through rolling sagebrush hills with small narrow valleys ranging in widths up to 0.6 mile. Some of these streams have been stocked in the past with rainbow, brook, and cutthroat trout (Dexter Pittman, UDWR, personal communication July 1978). Historically, the Bonneville (Utah) cutthroat (*Salmo clarki utah*), inhabited these streams (Hickman, 1978). These fish have been eliminated from this area by a

TABLE 2-17

Allotments with Streams

Allotment	HABITAT ACRES		Stream	Miles	Total
	Aquatic	Riparian			
Rabbit Creek	0.3	33	North Fork Six-mile	0.25	0.25
Duck Creek	1.5	208	South Fork Six-mile	3.25	
			North Fork Sage (upper reach)	0.75	4.0
Sage Creek	0.6	50	North Fork Sage (lower reach)	1.25	3.25
			Sage Creek	2.0	
Laketown	3.8	93	Laketown (lower)	4.0	
Twin Peaks (upper)	1.4	35	Laketown (upper)	1.5	5.5
New Canyon	6.5	357	North Fork Otter	5.0	
			Middle Fork Otter	1.75	
			South Fork Otter	0.75	
			New Canyon	1.0	
			Spring	0.5	
			Little	1.25	
			Old Canyon	1.75	12.00
Big Creek	9.1	151	Randolph	3.0	
			Big Creek	3.0	6.0
Woodruff Pastures	1.6	18	Birch	0.75	0.75
Middle Ridge	1.7	38	Walton	1.5	
			Woodruff	0.25	1.75
South Woodruff Meachum Canyon	0.9	48	Home[a]	1.0	
			Home[b]	1.0	2.00
	27.4	1,031	TOTAL STREAM MILES	35.5	35.5

Source: Wiche Report, 1975 (BLM Stream Inventory of Rich County).

[a] Aquatic habitat is the stream itself.
[b] Riparian habitat is the vegetation habitat next to the stream.

combination of factors such as nonnative species introduction, degradation and alteration of habitat, irrigation demands, and climatic changes (Hickman, 1978). All of the streams except Laketown Creek (which drains into Bear Lake) drain into the Bear River in Utah, which is a catch and release fishery (Dexter Pittman, UDWR personal communication July 1978).

Small reservoirs within the ES area also provide a fishing experience from trout hatchery stocking program (Dexter Pittman, UDWR personal communication July 1978). The largest reservoir, Neponset, is not currently used as a fishery because there is no public access.

The important fish species are the rainbow, brook, cutthroat, and brown trout because of their recreation and sporting value. The Bonneville (Utah) cutthroat trout (_S_. _clarki_ _utah_) is no longer found within the boundaries of the ES area. Reintroduction of this sensitive trout into six streams with suitable habitat (14.75 miles) within the ES area is being considered by UDWR and BLM (Hickman, 1978). These streams are shown in table 2-15.

Important habitat components for fish are temperature (Minckley, 1963), cover (Boussu, 1954), and stabilized streambanks (Kennedy, 1977). Habitat components are provided primarily by the adjacent riparian vegetation. Riparian vegetation is generally in a poor condition (Chapter 2, Vegetation) and has degraded fishery habitat to a poor condition (Wiche, 1975). These factors have been responsible for the loss of the Bonneville cutthroat and the streams being of such poor quality as to be only a put and take fishery (Don Duff, BLM personal communication, July 1978). Table 2-15 shows condition of streams in the Randolph area.

Livestock have access to all parts of the streams except Laketown, which has only limited access because of the steep surrounding terrain and 0.5 mile of Big Creek which is fenced to exclude livestock. Livestock use along riparian areas is considered to be heavy (URA Step 3, BLM) and has resulted in the loss of vegetation and cover, sloughing of streambanks, and temperature changes. These habitat conditions and trends have been documented by 1975 BLM stream inventory surveys, as well as from habitat monitoring studies on Big Creek begun in 1973 and continuing to the present.

There are no known threatened or endangered fish species in the ES area. Appendixes 12 and 14 provide detailed information on aquatic/riparian and fisheries habitat.

ARCHAEOLOGICAL AND HISTORICAL VALUES

During 1977, BLM completed a Class II 1-percent random sample survey and report on archaeological and historical resources on public land in Rich County. These data, in addition to previously located archaeological and historical site information, indicate that archaeological sites are typically thinly scattered across public land and are not generally considered highly important from a scientific or recreational standpoint. Public land in this area generally does not contain many of the good quality natural features desired by prehistoric inhabitants, which may account for low site density. Historical sites such as old ranches are common, but no historical structures on public land are considered to have major historical value. There are no National Register sites in the unit.

The cultural affiliation of known sites is given below:

Archaic	2	Shoshoni	1
Post-Archaic	1	Historic	1
Fremont	1	Unknown	18

It is doubtful that there are any sites in Rich County that have not been collected by "arrowhead hunters", or "antique collectors" making location and identification of cultural affiliation difficult (Randolph URA).

VISUAL RESOURCES

Visual resources in Rich County have been classified according to the procedures outlined in BLM Manual 6300. Classification takes into account scenic quality, visual sensitivity, and visibility. Figure 2-16 shows the visual resource management classes and objectives for public land in Rich County.

As pictured in figures 2-17 and 2-18, most public land is undeveloped rolling sagebrush prairie with narrow wet meadow riparian corridors in the valley bottoms. Livestock and associated range management facilities such as fences and spring developments are generally an integral part of the characteristic landscape. Range improvement projects scattered throughout the unit introduce visual contrast.

LAND USE

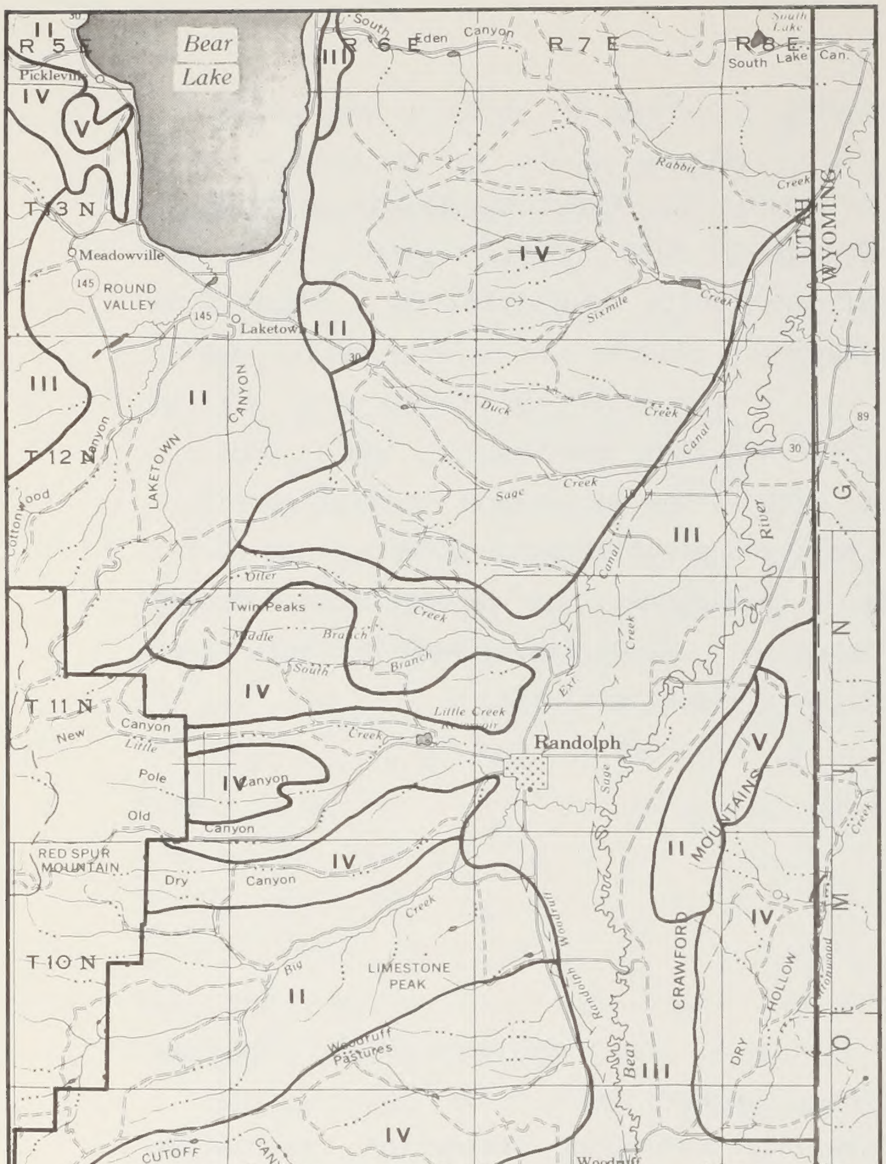
Introduction

Land ownership in Rich County is shown on table 2-18. The four general land types and principal land uses are:

1. High Mountains. Grazing, watershed protection, recreation
2. Upland Foothills. Grazing, dry land crops, recreational home sites (most of the BLM lands are located in this type)
3. Valleys. Irrigated crops, pasture grasses, permanent residential communities, water-oriented recreation areas
4. Bear Lake Basin. Outdoor recreation

Agriculture (grazing and farming) is the dominant land use (over 94 percent) in Rich County and the raising of cattle and hay crops is essential to the economy. However, agriculture accounts for only 34 percent of the total county employment (UTAH! FACTS, 1978). Recreation and tourism are becoming economically important, although recreation developments are confined almost exclusively to small, private land areas on the southern shores of Bear Lake.

RANDOLPH RANGE ES



LEGEND

Class I. This class provides primarily for natural ecological changes only. It is applied to primitive areas, some natural areas, and other similar situations where management activities are to be restricted.

Class II. Changes in any of the basic landscape elements (form, line, color, or texture) caused by a management activity should not be evident in the characteristic landscape.

Class III. Changes in the basic elements, (form, line, color, texture) caused by a management activity may be evident in the characteristic landscape. However, the changes should remain subordinate to the visual strength of the existing character.

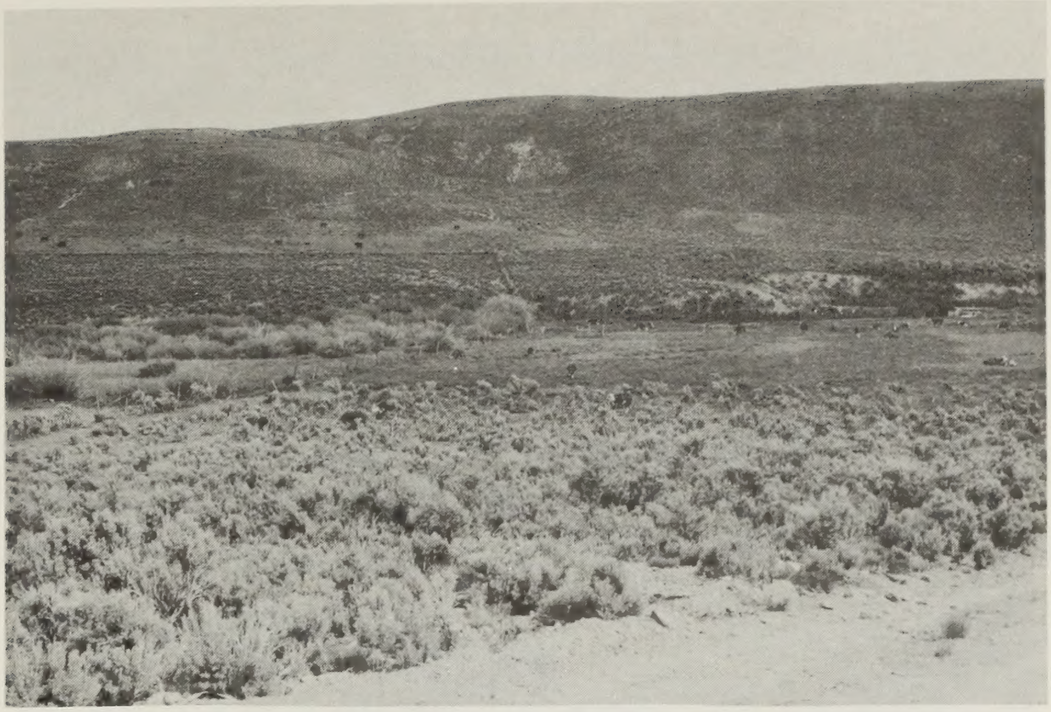
Class IV. Changes may subordinate the original composition and character but must reflect what could be a natural occurrence within the characteristic landscape.

Class V. Change is needed. This class applies to areas where the naturalistic character has been disturbed to a point where rehabilitation is needed to bring it back into character with the surrounding countryside. This class would apply to areas identified in the scenery evaluation where the quality class has been reduced because of unacceptable intrusions. It should be considered an interim short-term classification until one of the other objectives can be reached through rehabilitation or enhancement.

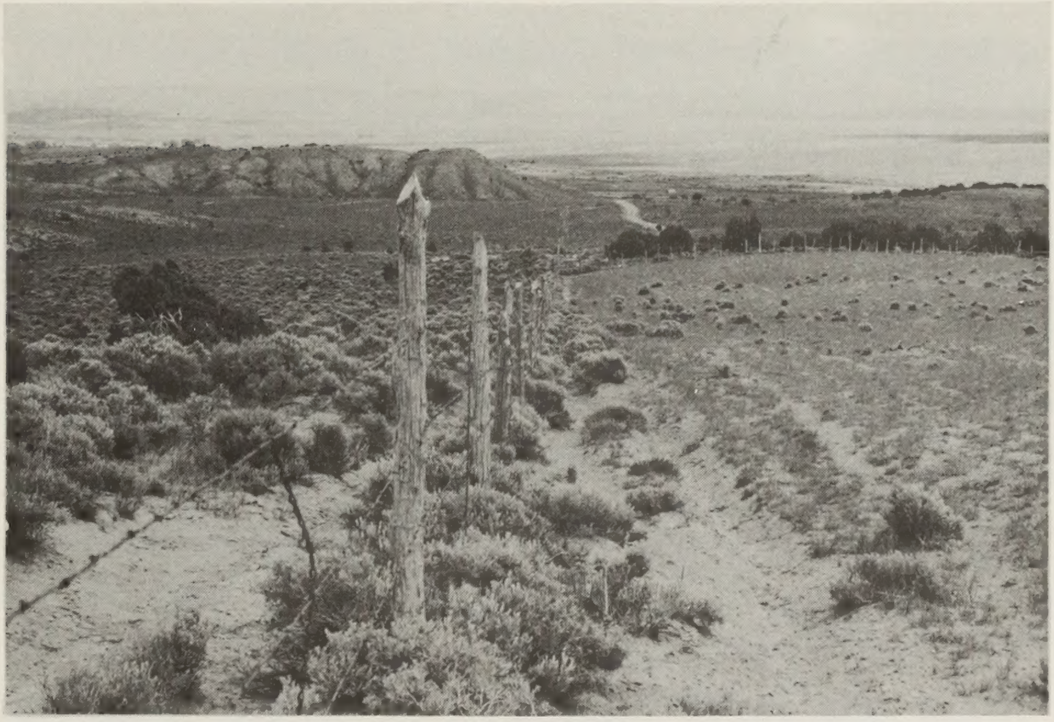
FIGURE 2-16

VISUAL RESOURCE MANAGEMENT

Classification and Objectives

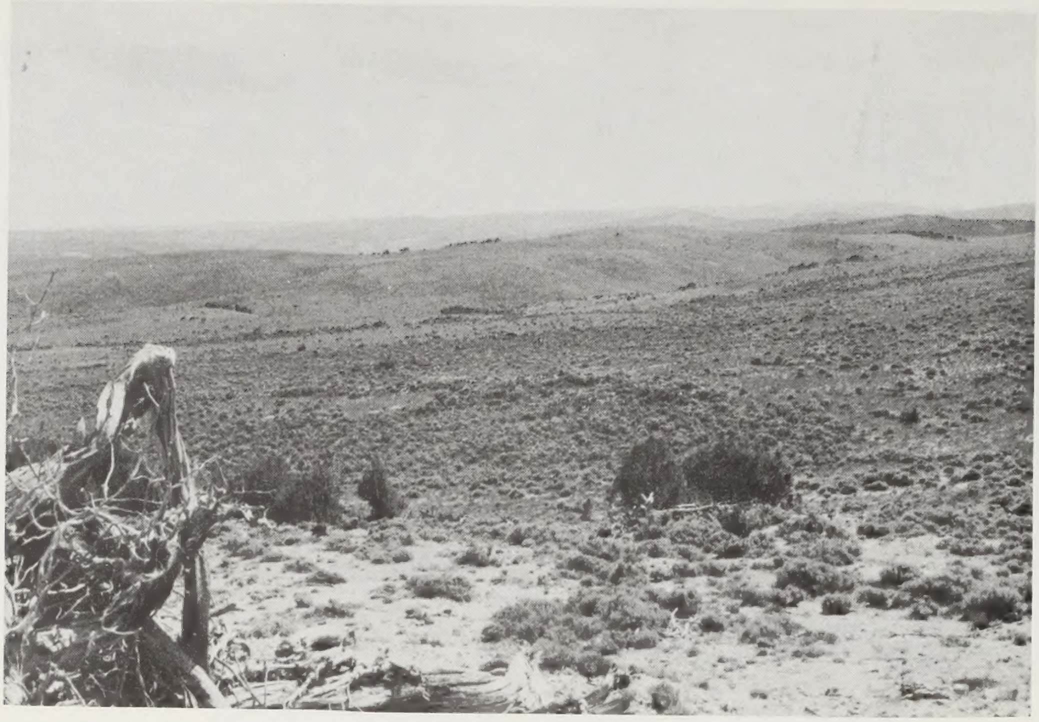


BIG CREEK ALLOTMENT – MEADOWLAND SHOWING FENCING CONTRAST BETWEEN WILLOW DOMINATED (LEFT) AND GRASS–SEDGE DOMINATED ZONES

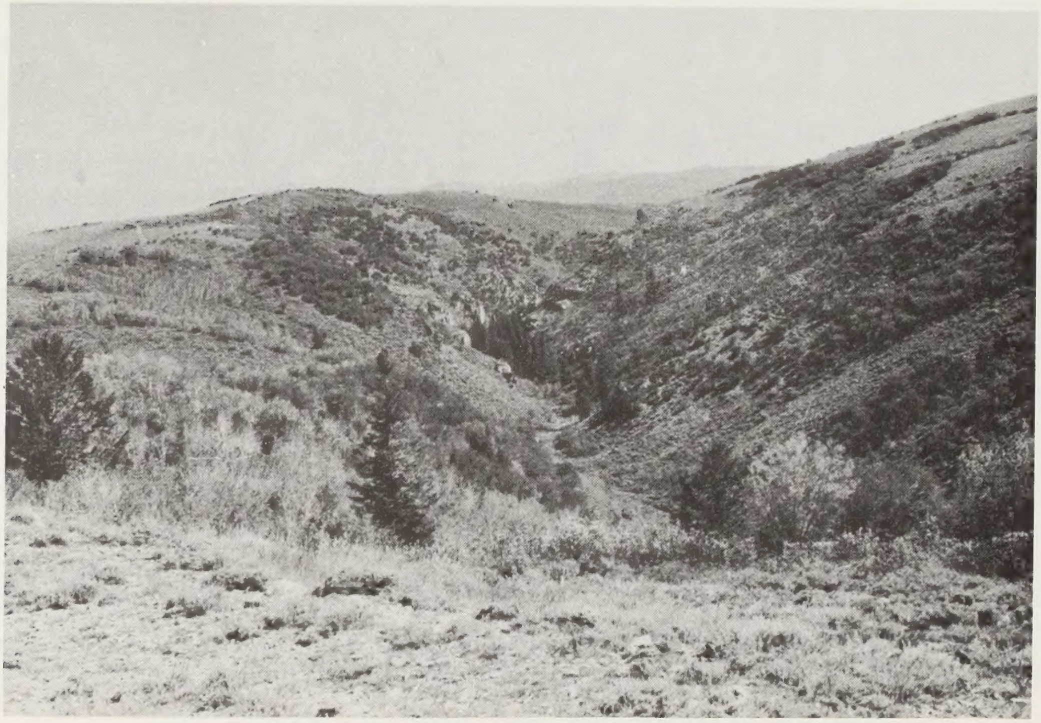


WOODRUFF PASTURES ALLOTMENT – FENCELINE CONTRAST ILLUSTRATING VEGETATION CHANGE DUE TO DIFFERENCE IN INTENSITY OF USE BY LIVESTOCK

FIGURE 2– 17



WOODRUFF PASTURES ALLOTMENT – FOREGROUND CHAINED AND SEEDED, BACKGROUND PLOWED AND SEEDED



LAKETOWN ALLOTMENT – PROPOSED AREA OF CRITICAL ENVIRONMENTAL CONCERN TO BE MANAGED FOR PRESERVATION OF NATURAL VALUES

FIGURE 2–18

VISUAL RESOURCES

TABLE 2-18

Land Ownership in Rich County and Randolph Planning Unit

Type	Rich County Acres	Percent of Total	Randolph PU Acres	Percent of Total
Private	381,436	58.45	351,202	61.71
BLM	170,583	26.08	[a]170,583	29.98
State of Utah	50,226	7.55	47,237	8.30
Forest Service	51,835	7.92	80	0.01
TOTAL LAND ACRES	654,080	100.00	569,102	100.00

NOTE: In addition to 654,080 land acres, Rich County contains 35,840 acres of water bodies, for a total land and water area of 689,920 acres. Only a fraction of the 35,840 acres of water bodies occurs on public land, mainly during high water or flood stages.

[a] 140,298 acres are considered in the proposed action.

Rich County is completely rural. Of its five small communities, only one has a population of 500 or more people. The 1970 U.S. Census recorded 1,615 people in the county (UTAH! FACTS, 1978); by 1990, the population is anticipated to be 1,936 (UPLAND Model Report, Utah State Planning Coordinator, 1977). The county is isolated from the main lines of transportation and communication. There are no regularly scheduled airline or bus stops, no railroad service, and only limited highway routes. Infrastructure growth is expected to remain stable (Randolph PAA, BLM, 1978).

Agriculture (farming)

Only 47,168 acres of the county are utilized as irrigated cropland, with the main crops being small grains and alfalfa. This irrigated land occupies the small areas of valley floor which are mainly floodplains.

The nonirrigated farmland occupies 19,382 acres (3.0 percent of the county). Spring wheat is the usual crop and it is frequently damaged or destroyed by cold. Most of the dry-farm land is situated on cleared, gently rolling hills, although some farmed sites reach a 15-percent slope.

The hay, forage grass, small grains, and wheat produced from these farms are used almost exclusively within the county. Hay and forage grasses harvested from the irrigated lands are particularly important to the local ranchers as food supplies for their animals during the winter when neither forest or public land is available for grazing.

Livestock Grazing

The most important product from the ranches and farms in Rich County is beef cattle. In 1975, approximately 28,931 cattle were marketed. The emphasis is on calf production rather than on fattening or raising market beef.

The Randolph Planning Unit has 19 allotments currently being grazed by 84 operators. Of these, two allotments are grazed by cattle, horses, and sheep; 10 allotments are grazed by cattle and sheep; six allotments are grazed by cattle alone; and one allotment is grazed by sheep alone.

Livestock winter on the hay meadows (base property), usually located in the valley bottoms. The livestock feed on hay cut from the meadows and on the hay aftermath left standing in the fields. The livestock are then turned out on public lands in May. Grazing continues through September for cattle, and as late as January for sheep. During this May-through-January period, the livestock may also graze private and State lands, as well as National Forest land. The livestock are then returned to the hay meadows for the late fall and winter period to complete a year's grazing cycle.

There are 24,124 AUMs currently authorized to be grazed (base property qualifications); however, average past licensed use over the past 5 years (1974 to 1978) was 22,898 AUMs. Of these, 6,101 AUMs are licensed for sheep, 18,023 for cattle (the few horse AUMs are included with the cattle AUMs). The size of the cattle operations is highly variable. The sheep operations are usually small, with a herd size of less than 700 sheep. A summary of present livestock use on the Randolph Planning Unit is shown in table 2-19.

TABLE 2-19

Existing Livestock Management

Allotment	Acres (BLM)[a]	Base Property Qualifications (AUMs)[b]	Class of Livestock	Season of Use
Bear Lake	1,198	187	Cattle	5/10-9/15
Big Creek	20,346	4,043	Cattle, sheep	5/10-12/31
Deseret	15,557	3,100	Sheep	5/1-11/15
Dry Basin	2,781	510	Cattle	5/10-7/9 11/25-12/31
Duck Creek	13,410	2,031	Cattle, sheep horses	5/10-12/9
Eastman	3,405	696	Cattle	5/1-10/15
East Woodruff	2,167	162	Cattle	5/1-6/30 12/1-1/7
Kearl	1,183	503	Cattle	5/10-9/30
Laketown	3,241	296	Cattle	5/10-9/30
Meachum Canyon	1,951	286	Sheep	6/16-11/30
Middle Ridge	1,286	112	Sheep	6/1-11/24
New Canyon	30,665	5,019	Cattle, sheep horses	5/16-9/30 10/23-11/18 5/10-5/16
Rabbit Creek	3,257	486	Cattle	5/10-10/10
Sage Creek	10,153	1,048	Cattle, sheep	5/10-9/30 10/30-11/8
Session	238	40	Cattle	5/16-9/15
South Woodruff	4,251	405	Cattle, sheep	5/1-12/31
Stuart	1,042	102	Cattle	5/16-6/19
Twin Peaks	2,292	273	Sheep	5/22-6/30 9/30-10/20
Woodruff Pastures	21,875	4,825	Cattle, sheep	5/16-9/15 11/1-1/25
TOTALS	140,298	24,124		

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[a] Includes lands suitable and unsuitable for livestock grazing.
[b] Does not include suspended nonuse.

Recreation

In Rich County, public land administered by BLM plays an important role in providing several kinds of recreational opportunities, among which are stream and lake fishing, mule deer and sage grouse hunting, wildlife viewing, and camping. Fishing is one of the major recreational activities. Several of the streams and most reservoirs contain trout, primarily rainbows, which are stocked regularly by the Utah Division of Wildlife Resources. Fishing success and visitor use are largely determined by quantity of fish stocked in each body of water. Most streams have the potential to maintain permanent naturally reproducing populations of several trout species, but stocking is currently necessary to maintain a viable fishing resource.

About 9,000 people fished on public land in Rich County in 1977. Most fishermen who visit the Randolph area travel from the major population centers along the Wasatch Front - Logan, Ogden, and Salt Lake City, a distance of 90 to 130 miles each way (Randolph URA, 1978).

Table 2-20 shows existing fishing quality ratings for major streams and reservoirs on public land in Rich County. Two factors that limit high quality fishing experiences are water quality (contamination) and unstable stream flows. (Appendix 14 describes quality rating factors and procedures.) Streams and reservoirs on public land are shown in figure 2-19. Although Bear Lake is only marginally affected by public land, it is by far the most important recreational attraction in Rich County. The lake is a major water sports resource having several highly developed public and private recreational facilities.

Public land also plays a major role in providing good mule deer hunting as shown by the following figures:

Year	Number of Hunters in Rich County	Rich County Harvest Success	Utah State Average Harvest Success
1976	5,180	36 percent	32.7 percent
1977	5,722	40 percent	35.0 percent

Figures from Randolph URA and UDWR Publication 78-2.

TABLE 2-20

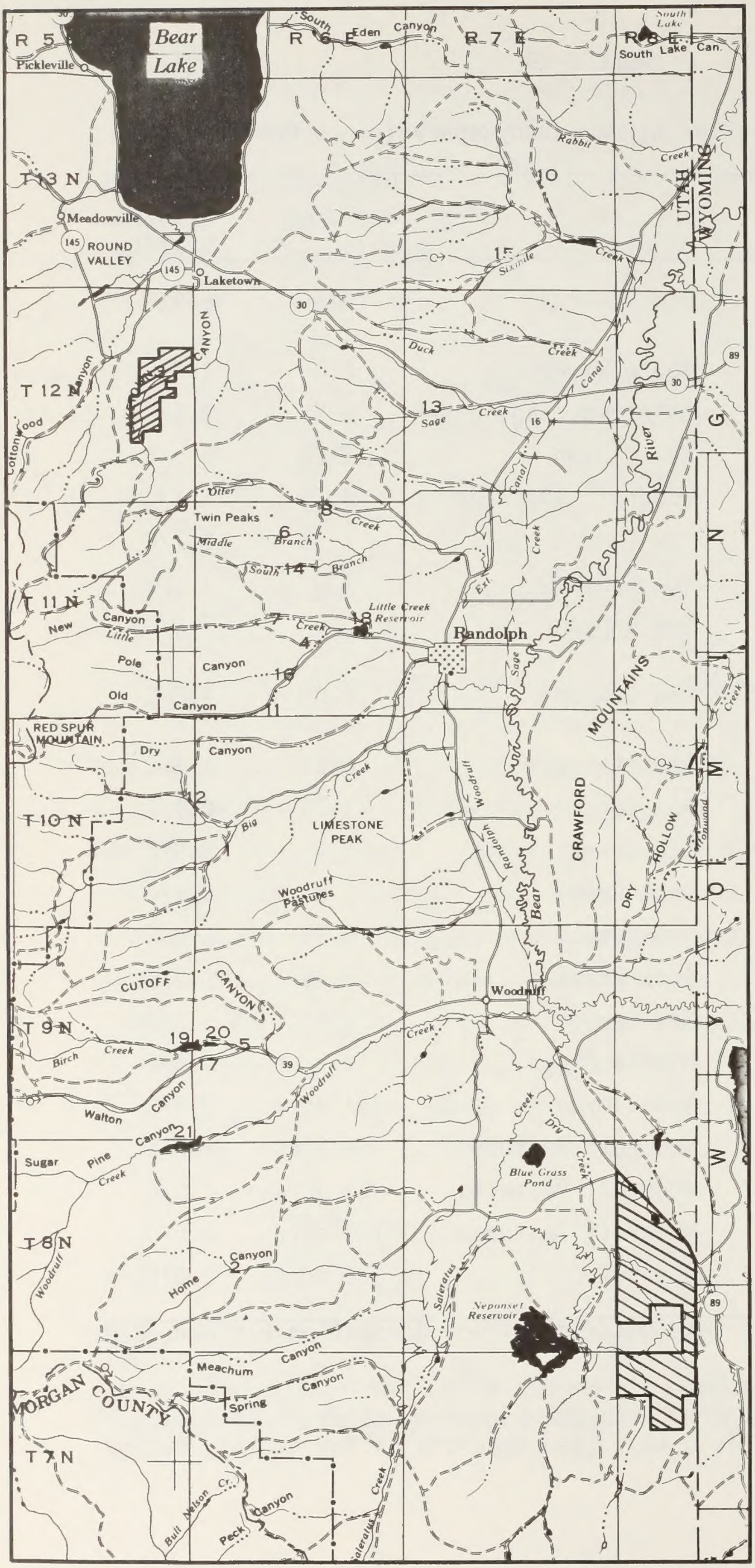
Fishing Quality Ratings for Streams and Reservoirs on Public Land

Stream or Reservoir	Allotment	Miles or Acres on Public Land	Existing Fishing Quality[a]
Big Creek (outside exclosure)	Big Creek	2.6	6.0/C
Home Canyon	South Woodruff	2.0	1.3/C
Laketown Creek	Laketown, Sage Creek	5.5	9.5/B
Little Creek	New Canyon	1.25	5.5/C
Lower Birch Creek	Woodruff Pastures	0.75	5.3/C
Middle Fork Otter Creek	New Canyon	1.75	5.7/C
New Canyon Creek	New Canyon	1.0	1.0/C
North Fork Otter Creek (lower)	New Canyon	3.0	7.0/C
North Fork Otter Creek (upper)	New Canyon	2.0	4.0/C
North Fork Six-mile Creek	Rabbit Creek	0.25	1.3/C
Old Canyon Creek	New Canyon	1.75	0.1/C
Randolph Creek	Big Creek	3.0	5.9/C
Sage Creek	Sage Creek	2.0	3.5/C
South Fork Otter Creek	New Canyon	0.75	6.0/C
South Fork Six-mile Creek	Duck Creek	3.25	1.5/C
Spring Creek	New Canyon	0.5	6.0/C
Walton Creek	Middle Ridge	1.5	3.5/C
Little Creek Reservoir	New Canyon	394 acres	8.0/B
Upper Birch Creek Reservoir	Woodruff Pastures	64 acres	9.0/B
Lower Birch Creek Reservoir	Woodruff Pastures	20 acres	4.0/C
Woodruff Creek Reservoir	Woodruff Pastures	140 acres	9.0/B
Neponset Reservoir	Deseret	670 acres	5.0/C

Source: J. Skibinski, Salt Lake District Office Recreation Planner, BLM.

[a] Recreation Information System (BLM Manual 6110) for rating quality of recreational experiences. An "A" (highest quality score is 11 to 12, a "B" is 8 to 10, and a "C" is 0 to 7 (see Appendix 14 for quality rating factors).

RANDOLPH RANGE ES



LEGEND

Stream or Reservoir

1. Big Creek
2. Home Canyon Creek
3. Laketown Creek
4. Little Creek
5. Lower Birch Creek
6. Middle Fork Otter Creek
7. New Canyon Creek
8. North Fork Otter Creek (Lower)
9. North Fork Otter Creek (Upper)
10. North Fork Sixmile Creek
11. Old Canyon Creek
12. Randolph Creek
13. Sage Creek
14. South Fork Otter Creek
15. South Fork Sixmile Creek
16. Spring Creek
17. Walton Creek
18. Little Creek Reservoir
19. Upper Birch Creek Reservoir
20. Lower Birch Creek Reservoir
21. Woodruff Creek Reservoir
22. Neponset Reservoir

▧ Deseret Roadless Area

▨ Laketown Canyon ACEC (Proposed)

FIGURE 2-19

RECREATIONAL RESOURCES

Most hunters come from the Wasatch Front area, however, deer hunters are known to travel across the State if they anticipate greater hunting success.

About 1,000 people hunt sage grouse in Rich County each fall accounting for 6 to 10 percent of the total hunting pressure in Utah (Randolph URA).

Appendix 13 describes wildlife condition rating criteria for both deer and sage grouse.

Opportunities for viewing diverse forms of wildlife also exist on public lands, particularly along the more natural riparian zones which contain a variety of plant species (such as grass, sedge, willow, rose, currant, aspen, chokecherry, etc.). See the Wildlife section, this chapter, for a discussion of wildlife species in Rich County, their population trend, and habitat condition. Viewing opportunities are influenced by these characteristics.

Most camping on public land occurs in the developed campgrounds at Birch Creek and Woodruff Creek Reservoirs. Camping also occurs throughout the unit in association with deer and elk hunting, and stream fishing. Existing livestock use is currently affecting quality camping opportunities in some areas because heavy grazing of stream reaches results in excessive numbers of horseflies, ground trampled bare, disagreeable odors, unpleasant manure buildup at tent and picnic sites, and possible sanitation problems (Randolph URA).

Access to public land is now becoming more of a problem for recreational users in Rich County because, in many cases, posted private land must be crossed to reach public land (Randolph URA).

Wilderness

Wilderness values were considered as a land use during development of the Randolph Planning Unit URA-MFP. Using criteria given in the Wilderness Act of 1964, one roadless area was identified: Deseret, 6,167 acres (fig. 2-19). This roadless area falls into the category of land that clearly and obviously does not have good wilderness values and will not be intensively inventoried or classified as a Wilderness Study

Area. Wilderness inventory requirements as legislated in FLPMA have been satisfactorily completed during the planning process and are documented in Appendix 3 and Salt Lake District Office files.

One other proposal involving wilderness values relates to the proposed action. Laketown Canyon (1,280 acres, fig. 2-19) is proposed as an Area of Critical Environmental Concern (ACEC) with management emphasis on maintenance or improvement of scenic quality and natural values.

SOCIOECONOMICS

Introduction

The ranching-stockman lifestyle has historically been a dominating element of the Rich County social character, which imposes an overriding tone for any social/cultural study of the county and its residents. This section presents a discussion of the social/cultural and economic conditions of the Rich County area. The evaluation of these conditions was performed to determine which social and economic institutions have an intrinsic stake in both the current and future management of Bureau-administered lands in the county. If the effects of BLM managerial decisions are likely to cause a disruptive departure from the norm for any given social or economic institution, then that departure must be considered with respect to its magnitude and significance. The significance of any given socioeconomic condition is measured against three gauges:

1. Local residents and community leaders were interviewed to establish the "local view" of significant socioeconomic issues;
2. Bureau of Land Management data were reviewed to establish the level of Bureau involvement in the Rich County area; and
3. Secondary data including local, State, regional, and national statistics on agriculture, business, employment, income, population, and

government were consulted to establish Rich County's position with respect to State, regional, and national socioeconomic trends.

The following material presents socio/cultural and economic conditions prevalent in Rich County.

Social/Cultural

There are five towns in the county: Garden City (population 149); Laketown (population 217); Pickelville (population 120); Randolph (population 507), and Woodruff (population 180). Because of the county's remoteness, concentration on agriculture (Land Use section, this chapter), and lack of in-migration (1974 Census of Agriculture, Utah State County data), most of its residents share a common, almost homogenous, background which includes emphasis on family stability and community ties, a ranching identity, and a strong sense of individualism and independence. Interviews and personal contacts by BLM in 1977 to 1978 (Randolph PAA) with residents and community leaders indicate they resent and oppose outside influences attempting to exert control over any matters they view as being their local affairs. Although long-term statistics indicate that agricultural employment is declining, it continues to exert the major influence on county lifestyles and attitudes (Randolph PAA).

Employment and Income

In recent years, the proportion of the county population employed in agriculture has fallen substantially but that decline has been offset by a steady rise in government hiring, (mainly State and local), along with some gains in the nonfarm sector (tourism). According to current statistics (Utah Department of Employment Security Newsletter, March 1978), Rich County has the lowest unemployment rate in the State. This March 1978 Newsletter also indicates a relatively sluggish local economy, with such economic indicators as per capita personal income below the State average, nonresidential construction steadily declining, and new car and truck registrations below normal.

Population Age Trends

Age groupings of the county population indicate a high proportion in the ages 5 to 25 (school age through young adult), with a fairly steady reduction in subsequent age categories. Such a distribution pattern indicates a substantial out-migration of young adults, leaving a stable, long-term population base in the higher age brackets. Agricultural statistics confirm this observation in the farm sector in table 2-21. The average age for all Rich County livestock operators is about 52 years.

TABLE 2-21

Farm Population Statistics

Age Group	Percent of Farm Population 1969	1974
Under 25	0	1
25 to 34	9	14
35 to 44	24	15
45 to 54	25	19
55 to 64	28	36
65 and over	14	15
Average age	50.3 years	51.6 years

Source: 1974 Census of Agriculture, Utah State and County Data

Economic Conditions

Although economic conditions and social/cultural attitudes within Rich County are dominated by livestock interests, there are numerous nonlocal groups that also express concern about and desire participation in the BLM decision-making process for resource use in the Randolph Planning Unit. These are categorized as preservation, conservation, and wildlife groups; mining, oil and gas, and other energy development concerns; and other governmental agencies and Congressional delegations. Hard data on the level of use and dependence on BLM lands in Rich County by these interest groups are not available, so further analysis of their positions is constrained. The economic information presented in this section is keyed to the Rich County livestock industry because it is this segment of the user population that has direct economic interest in the current and future BLM management in the Randolph Planning Unit. The information is essentially a collection of interrelated calculations compiled to illustrate the current economic conditions facing the planning unit operators. There were several steps involved: first, the individual ranch operations were grouped on the basis of economic scale or size class, e.g., small, medium, or large operations. Next, ranch budget sheets were constructed which illustrate the types of incomes and expenses encountered by each class. Finally, three break-even analyses were performed to depict how much above or below the break-even point the average ranch is operating within each scale.

More detailed explanations of each of these steps are presented below.

Ranch Scales

The main structure on which the following analysis rests is the organization of individual ranch operations on the basis of economic scale. Based upon personal contacts with numerous Randolph Planning Unit permittees (approximately 15 percent), the conclusion was made that the ranch operations fall fairly reliably into three generalized divisions: small, medium, and large (these will be more specifically defined in subsequent sections). The advantage of this approach is that general conclusions (required by a consistent and logically tractable decision-making process) can be drawn from the work. The assumption which is inherent in this approach is that the individual operations within each class are sufficiently represented so that the conclusions drawn about the group as a whole apply to most individual operations contained within it. Based upon data obtained from permittees, the grouping breakdown is as follows:

Scale	Number of Livestock
Small	1 to 100 head
Medium	100 to 500 head
Large	More than 500 head

The terms "small, medium, and large" apply only to Rich County ranch operations. The terminology is intended to be only locally descriptive rather than universal.

Ranch Budget Sheets

Ranch budget sheets were then developed for each class displaying the revenues and expenses for the "average" ranch within the grouping and providing the baseline data for all subsequent economic calculations.

The data which support these analyses were collected from Rich County ranchers. The figures represent the ranchers' best estimates of costs and revenues which could be expected in a "normal" year (that is, a year free of drought, flooding, serious insect infestations, or other abnormalities). The calculations represented in the ranch budgets do not purport to examine such things as tax advantages (or liabilities) which may apply to ranch operations or the actual accounting structures which ranchers themselves use. Nor do they represent projections of what might happen as a result of inflation or livestock market fluctuations. Also, it should be noted that due to data gaps, interpolations, etc., the small scale ranch data are less reliable than those for the other two size classes.

Break-Even Analysis

Break-even analysis is employed in order to depict the relative profitability of the respective ranching operations. In short, this type of analysis relates ranch operation costs to revenues in order to determine how much gross income must be obtained from livestock sales to break even (hence, the name) with fixed and operating costs. This method has been employed because it can yield useful information about the effects of fluctuations in gross incomes or expenses on profit. It is also particularly applicable in instances where "profit maximization" is not necessarily the prime motive of the operation (such as in the case of a rancher desiring to maintain his identity as a stockman rather than obtain higher income levels at some other job). This appears to be particularly valid when applied to small and medium-sized operations.

Ranch Finances

The final constricting assumption which has been made concerns the question of whether or not to include off-ranch income in the calculations. For the purposes of this environmental statement, the off-ranch incomes have not been directly incorporated in the analysis because they are not associated in a primary sense with the Randolph Planning Unit. However, to the extent that planning unit management may have a secondary effect on such incomes, they will be addressed.

Survey of Three Scales of Rich County Ranches

Small Scale Operations

Of the 84 licensed permittees using public lands in the Randolph Planning Unit, approximately 38 are classed as small. Their private holdings average about 295 acres; these ranches run from 1 to 100 head of livestock with an average of 65 head and annual AUMs average 1,022. The base property supports around 81 percent or 828 AUMs. BLM rangelands yield another 148 AUMs or 14 percent. However, adjusted to reflect the seasonal dependencies of the small operator, BLM grazing represents approximately 42 percent of his needs from May 10 through September 15.

From these operations, the average gross income received from the sale of about 46 calves and eight cows is $9,218 (table 2-22). Subtracting $7,791 in expenses from this figure yields $1,427 net income to the small operator. Typically, he will supplement this income with an off-ranch job which can be either part or fulltime. These jobs frequently comprise the major portion of the family's net income, averaging $6,140 per year above ranch-derived income.

Medium Operations

Thirty-three of the Randolph Planning Unit ranching operations fall into this group. These ranches average about 1,275 acres of base property. Ranchers run from 100 to 500 head, but average around 283, which is equivalent to 3,530 AUMs annually (this figure is low because some sheep operations are included). Of these 3,530 AUMs, approximately 31 percent are supported by private range or home grown feeds. Although the medium size rancher depends on BLM land for approximately 10 percent of his AUMs, after adjusting this figure for seasonal use patterns, he depends on BLM rangeland for approximately 24 percent of this total forage needs from May through September.

In recent years, these operations have typically averaged the sale of 147 calves and 41 cows and bulls (and with some operations, around 87 lambs and 1,350 pounds of wool), grossing around $36,700, yielding a net annual loss of around $10,900 (table 2-22). Obviously, such losses cannot be sustained over the long term; rather, they reflect a depressed market in which the expenses of bringing livestock to market have exceeded the prices received. A condition which aggravates this problem is that the medium size rancher typically cannot supplement his ranch income with off-ranch sources since he is nearly fully committed to the ranch operation. Also, the average operator is severely constrained from diversifying his activities because of the limited capital and property with which to diversify.

Large Operations

There are approximately 14 ranchers utilizing BLM rangelands who fall in this category. These operations hold an average of 5,200 acres

TABLE 2-22

Ranch Budget Sheets

	Small Scale	Medium Scale	Large Scale
INCOME			
Calves, yearlings, cull cows, bulls	$ 9,218.00	$32,351.00	$ 78,818.00
Lambs, ewes, rams, wool	....	4,326.00	....
Other ranch income	....	....	31,000.00
Total ranch income	9,218.00	36,677.00	109,818.00
Nonranch income	6,140.00	....	....
Total income	$15,358.00	$36,677.00	$109,818.00
EXPENSES			
Fixed costs			
Taxes	$ 780.00	$ 2,603.00	$ 3,000.00
Building repairs	530.00	3,008.00	3,300.00
Fertilizer and herbicide	....	180.00	2,350.00
Seed and supplies	....	100.00	300.00
Irrigation	306.00	788.00	1,200.00
Rent	....	883.00	6,300.00
Miscellaneous expenses	394.00	2,440.00	2,000.00
Utilities	1,413.00	1,735.00	2,720.00
Interest on loans	1,575.00	5,078.00	20,000.00
Predator control	....	20.00	....
Depreciation	....	6,981.00	7,650.00
	$ 4,998.00	$23,816.00	$ 48,820.00
Variable costs			
Grazing fees (BLM)	$ 280.00	$ 738.00	$ 1,771.00
(USFS)	98.00	283.00	534.00
Feed	....	14,003.00	1,837.00
Livestock purchases	....	450.00	1,800.00
Veterinary fees	117.00	306.00	830.00
Freight and trucking	371.00	368.00	1,400.00
Fuel and oil	1,757.00	3,110.00	3,060.00
Death losses	....	1,512.00	3,216.00
Labor	170.00	2,624.00	3,100.00
Machinery	....	370.00	220.00
	$ 2,793.00	$23,764.00	$ 1,771.00
GROSS INCOME PER AUM	$9.02	$10.37	$14.38
TOTAL COST PER AUM	$7.62	$13.48	$ 8.72
AVERAGE FIXED COST PER AUM	$4.89	$ 6.77	$ 6.39
AVERAGE VARIABLE COST PER AUM	$2.73	$ 6.73	$ 2.33
NET INCOME PER AUM	$1.40	($ 3.09-)	$ 5.66
AVERAGE STOCKING LEVEL (AUMs)	1,022	3,530	7,632
BREAK-EVEN POINT	$ 7,171.00	$67,645.00	$ 58,243.00

Source: Estimates derived from rancher interviews. Data represents average from several respones (1978).

in base property. Ranging from 500 head upward, the average herd is approximately 536 head. On an annual basis, this figure is equivalent to about 7,637 AUMs. Of this amount, approximately 64 percent are supported by private feed (base property and home grown feeds) and 12 percent from BLM permits. For the period May through September, the large operators typically depend upon BLM permits for 35 percent of their forage needs.

The average large operation markets about 154 calves, 95 yearlings, and 66 cows and bulls each year. These sales gross approximately $109,818 minus $66,588 expenses, leaving a net income of $43,230 (table 2-22). The ranchers with large operations also have additional income sources from sales of grain and various special leases. Of the three scales these ranchers are the most capable of diversifying their operations to meet changing market conditions.

Table 2-23 presents a summary of data concerning the ranch operations.

TABLE 2-23

Summary of Ranch Operations

	Small	Medium	Large
Average number head	65	283	536
AUMs	1,022	3,530	7,637
Average gross income	$9,218.00	$36,667.00	$109,818.00
Average fixed costs	4,998.00	23,816.00	48,820.00
Average variable costs	2,793.00	23,764.00	17,768.00
Average net income	1,427.00	(-10,903.00)	43,230.00
Net income per AUM	1.40	(-3.09)	5.66
Break-even point	7,171.00	67,645.00	58,243.00
Percent annual dependence on BLM	14	10	12
Percent seasonal dependence	42	24	34

Source: Table 2-22

Economic Summary

The Bureau's role in the socioeconomic interactions of Rich County must be viewed from the perspective that it is one of many factors, some national and others more local, with which Rich County residents are faced.

For Rich County ranchers, there are two basic categories of economic concerns: (1) the annual returns to their investments of land, labor, and capital; and (2) the long-term capital value of the ranch property.

Annual Returns

The factors which affect the potential annual returns are: (1) price per unit weight at sale; (2) weight per animal; (3) number of animals; and (4) costs of raising the animal to marketability. Current and future BLM management has the potential of affecting all but the price per unit weight.

Capital Values

The capitalized value of a grazing permit can assume either of two identities. It can represent the grazing permit as a portion of the ranch property, in which case it can be offered as collateral in securing loans. Or, it can represent a salable commodity for which a potential buyer must bid. BLM policy neither sanctions nor prohibits such values being attached to permits. It simply recognizes that as of 1978 a BLM permit is worth $1.89 per AUM. Therefore, any additional costs beyond this amount to a rancher purchasing grazing privileges from a previous holder are viewed as a gamble on the buyer's part, the risks for which are borne solely by him. However, in terms of the total financial viability of a ranch enterprise, impacts to its capitalized values can be quite important. Therefore, the exploratory calculations in Appendix 15 provide a basis for understanding how changes in permit sizes can affect changes in capitalized values.

CHAPTER 3

THE PROBABLE ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

CHAPTER 3

THE ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

INTRODUCTION

Background

This chapter identifies the probable environmental impacts of the proposed action. Significant impacts are those which (1) affect the quality of the human environment; (2) are controversial; or (3) affect a legally protected species or resource. Short-term or initial impacts are those that would occur as a result of implementing the initial action. Long-term impacts are those that would occur from the long-term component of the proposed action. Generally, duration of initial impacts would last up to 5 years; duration of long-term impacts would be from 5 to 20 years or beyond.

The analysis of impacts presented is designed to be commensurate with the expected magnitude, intensity, duration, and incidence of impacts.

The probable impacts are traced from the proposed action to man and his environment. This requires following impacts from one environmental component to another until the ultimate significance of an impact has been evaluated.

Each impact is analyzed in a cause and effect manner, and secondary impacts are identified and pursued as far as practical. The cause identified is tied to a component of the proposal (Chapter 1) and the effect identified is tied to a component of the environment (Chapter 2).

In this chapter, the analysis process is keyed to a series of narratives and summary tables which describe both positive and negative impacts associated with specific environmental resource components. These summaries are based on a detailed analysis and a cause-effect documentation process as described in Appendixes 16, 17, and 18.

The most dominant direct impact from livestock grazing would occur on the vegetation resource; however, direct impacts would occur to a lesser extent on other resources (such as soils, wildlife, and socioeconomics). Changes in production, condition, trend, and potential of vegetation would cause indirect effects to other resources.

The impact discussion presented in this environmental statement does not cover all of the intricate aspects of the ecological conditions in the Randolph Planning Unit. Rather, the statement highlights those portions of the analysis that are considered by BLM to be of primary interest to the public, to other agencies, and to resource decision making for the public lands involved.

Impacts are discussed by resource components in Chapter 3 in the same order in which the resources are introduced in Chapter 2.

Assumptions and Analysis Guidelines

In order for the analysis to be conducted, and to make projections of impacts into the future, certain assumptions and analysis guidelines are required as follows:

1. The proposed action would be fully implemented and monitoring studies would be carried out as indicated in Chapter 1.

2. Mitigating measures listed in Chapter 1 would be carried out as construction stipulations (page 1-8, 1-11, and Appendix 8).

3. Proposal assumptions and objectives on page 1-4 would be applicable.

4. The proposal would exercise control of intermixed State and private lands only to the extent provided in existing and/or future exchange of use agreements between the State, the livestock operators, and BLM. Impacts to State and private lands would not be treated separately in the analysis; however, it is assumed impacts would be similar to those identified for public lands.

5. The proposal would not involve any direct BLM control over private lands which are intermixed within the livestock allotments where exchange of use agreements do not exist.

6. Due to the difficulty of predicting future livestock market conditions, an assumption that current market conditions would prevail is necessary for socioeconomic analysis. Any future changes in

livestock market conditions would be a result of variables outside the proposed action discussed in this statement.

7. Livestock use would occur as authorized in the proposed action.

IMPACTS TO AIR QUALITY

Initial Action

Any increase in vegetation cover brought about by a later turn-on date or decreased intensity of grazing would reduce the potential for windblown dust. A reverse of such actions would increase the potential. However, no appreciable change in air quality is anticipated.

Long-Term Management

Proposed grazing and resting treatments (Appendix 5) would not cause a change in air quality in the area.

Vegetation treatments are proposed to occur on 65,187 acres in the form of burning or spraying of sagebrush. These treatments would cause immediate impacts (only a few days) on a given prescribed burn area, but they would occur over a 10-year period on 14 allotments. Burning would take place in the fall and spraying in the spring. No burning may take place until permission has been given by the Executive Secretary of the Utah Air Conservation Commission or his authorized representative (State of Utah Air Conservation Regulations, 10/13/78). One factor that would be taken into account by the Executive Secretary of the Utah Air Conservation Commission or his authorized representative would be the pollutant dispersion potential on the day of a proposed burn. If dispersion is considered poor for that day, permission to burn could be denied. Limiting the days of burning to those with good dispersion potential would minimize the effects of the gasses and particulate matter on the area. However, short excursions over the NAAQS could still occur.

Impacts from burning sagebrush on 5,072 acres (table 1-5) include the release of heat, gasses, and particulate matter. The majority of the gasses released would be nitrogen oxides, carbon monoxide, and hydrocarbons. Since the National Ambient Air Quality Standards (NAAQS) regarding nitrogen oxides are based on an annual average basis (as nitrogen dioxide), the burnings are not anticipated to violate the NAAQS. The short-term NAAQS for carbon monoxide (8-hour and 1-hour), particulate matter (24-hour), and hydrocarbons (3-hour, 6:00 to 9:00 a.m.) could be approached or exceeded. Impacts from a burn would be felt over the immediate area of the treatment and would decrease rapidly with distance. The proposed burnings would take place over a 5-year period immediately following implementation of the management plan. At present, there are no rate-of-spread studies for fires in sagebrush and grass. However, experience in the field has shown that burning of the proposed 5,072 acres could take up to 2 weeks total time (personal communication George Kasper, BLM Utah State Fire Office, April 1979). The burns would be spread out over 5 years, with the majority of acres (72 percent) being treated in the third year of implementation (table 1-5).

Based on calculations from BLM Manual 7311 (assuming helicopter application, 15-foot swath width, and 35 miles per hour), a single helicopter could cover about 250 acres per day (4-hour spraying day). The duration of the spraying of 60,115 acres of big sagebrush with 2,4-D would be determined by the number of helicopters and number of hours per day of operation. One helicopter is estimated to take approximately 240 days (over the 5-year implementation schedule) to spray the proposed areas. The length of exposure to spray on each of those days, however, is assumed to be minimal. Since wind conditions for spraying are generally very light to allow maximum settling of spray to the ground, the formulation to be used is a low volatile one, the impact to surrounding areas would be kept to a minimum. The actual amount of herbicide which becomes airborne is unknown, but studies have shown the impacts to be negligible (Josephine Final Timber Management Environmental Statement, BLM).

Conclusion

The impacts from the proposed management actions would be short term (less than 10 years). Due to the limited number of days on which burning would occur and the precautions required by the Executive Secretary of the Utah Air Conservation Commission, any impacts to air quality from burning of sagebrush would be minimal. Spraying of sagebrush with 2,4-D would also have minimal impacts to air quality due to the limited number of hours of spraying per day, the low wind spray conditions, and the low volatile formulation of 2,4-D being used.

IMPACTS TO SOILS

Soil erosion is the general term applied to the process of soil particle detachment and movement. Some of the factors that influence erosion are soil compaction, infiltration, runoff, and condition of the range land. In the ES area, wind erosion is of minor importance compared to water-caused erosion impacts, which are discussed further in this section.

Aspects of the proposed action that would influence the erosion factors noted above are changes in grazing intensity, vegetation treatments, and proposed projects such as pipelines, wells, and fences. Exclusion of livestock for future development of recreation sites (7 acres) and proposed land disposal of Middle Ridge, Session, and parts of eight other allotments (2,611 acres) may also have an effect on soil and watershed values; however, soils-related impacts cannot be projected since no information is available regarding the intensity of use after disposal or development. Therefore, no further discussion of impacts to soils from these actions will be presented.

Research data indicate that light or moderate grazing of native ranges does not increase erosion. For example, Dunford (1949) reported that moderate grazing (40 to 55 percent utilization of key species) did not significantly increase soil erosion, but heavy grazing produced a marked increase. Thus, in terms of the proposed action, if the grazing use is not increased beyond a moderate intensity (60 percent utilization), erosion should not be significantly affected, provided the allotment is in good or fair erosion condition. All of the allotments were evaluated in terms of erosion impacts under initial and long-term management.

While current rates of sediment yield are available by allotment, a specific numerical value for the anticipated changes in soil erosion rates cannot be determined. This is due to a lack of suitable predictive models and the large number of variables encountered under field conditions. For this reason, anticipated changes in soil erosion rates are given in terms of "more" or "less" erosion. It is recognized that these are subjective terms and the predicted impacts are less precise than desired.

Initial Action

As a result of the proposed grazing intensity changes shown in table 3-1, the Big Creek Allotment would experience less erosion due to reducing the present grazing intensity from heavy (which is known to cause erosion) to a moderate level. The remaining 18 allotments are not expected to experience a significant change in their present erosion rates since all remaining changes in grazing intensity are at or below a moderate level.

Two of the allotments, Middle Ridge and Session, would be disposed of during the initial action timeframe (within 5 years); eight other allotments would have small disposal acreages also. Total disposals and recreation site development would amount to 2,618 acres and will not be discussed further in the analysis of impacts to soils.

In four allotments, 208 acres of riparian habitat would improve within 6 to 8 years to excellent condition due to the fencing of 8 miles on six streams. The streambanks would stabilize, reducing sediment load increases from streambank sloughing. This conclusion is based on research done by Winegar (1977) Kimbal and Savage (1977), and Mueggler (1975).

TABLE 3-1

Projected Erosion Based on Grazing Intensity (Utilization) Changes for the Nontreated Areas

Allotment	Present[a] Erosion Condition	Present[b] Grazing Intensity	Proposed Livestock Grazing Intensity		Projected Erosion Change			
			Initial	Long Term[c]	Initial	Acres	Long Term	Acres
DISPOSAL								
Middle Ridge	Good	Slight	Light	Light	No Change	1,286	No Change	1,286
Session	Fair	Moderate	Moderate	Moderate	No Change	238	No Change	238
CONTINUE INTITAL ACTION MANAGEMENT								
Eastman	Poor	Moderate	Moderate	Moderate	No Change	3,405	No Change	3,405
Deseret	Poor	Light	Light	Light	No Change	15,557	No Change	15,557
South Woodruff	Poor	Heavy	Heavy	Heavy	No Change	4,251	No Change	4,251
IMPROVED MANAGEMENT								
Bear Lake	Fair	Moderate	Moderate	Moderate	No Change	1,198	No Change	603
Big Creek	Fair	Heavy	Moderate	Moderate	Less Erosion	20,346	Less Erosion	5,160
Dry Basin	Good	Light	Light	Moderate	No change	2,781	No change	502
Duck Creek	Fair	Heavy	Heavy	Moderate	No change	13,410	Less erosion	2,433
East Woodruff	Fair	Slight	Light	Moderate	No change	2,167	No change	1,781
Kearl	Good	Moderate	Slight	Moderate	No change	1,183	No change	704
Laketown	Good	Moderate	Moderate	Moderate	No change	3,241	No change	3,019
Meachum Canyon	Poor	Slight	Slight	Moderate	No change	1,951	More erosion	394
New Canyon	Poor	Moderate	Moderate	Moderate	No change	30,665	No change	20,578
Rabbit Creek	Good	Light	Light	Moderate	No change	3,257	No change	80
Sage Creek	Good	Moderate	Moderate	Moderate	No change	10,153	No change	4,314
Stuart	Good	Moderate	Light	Moderate	No change	1,042	No change	291
Twin Peaks	Good	Light	Light	Moderate	No change	2,292	No change	1,496
Woodruff Pastures	Fair	Moderate	Moderate	Moderate	No change	21,875	No change	8,994

[a] From table 2-4.
[b] From table 2-9.
[c] From table 3-6.

Slight = 0 to 20 percent use of current year's growth
Light = 21 to 40 percent use of current year's growth
Moderate = 41 to 60 percent use of current year's growth
Heavy = 61 to 80 percent use of current year's growth

There are 3,827 acres of land in critical erosion condition within the Deseret, Eastman, New Canyon, and South Woodruff Allotments. No change in the erosion condition is expected because the level of grazing intensity in these allotments would not change.

Long-Term Management

In the long term, impacts to soils would not change from the initial action in three allotments: Eastman, Deseret, and South Woodruff.

The Big Creek Allotment would continue to experience less erosion on 4,839 acres of untreated land as a result of the reduced grazing intensity noted under the initial management action. The Duck Creek Allotment would experience less erosion on 2,179 acres because the level of grazing intensity would be reduced from heavy to moderate. Meachum Canyon is expected to experience increased erosion on 390 acres of untreated land because the allotment is in poor erosion condition and the proposed action would increase the use intensity from slight to a moderate level. The remaining 11 allotments are not expected to experience a significant change in their present erosion rates since any proposed changes in grazing intensity would be at the moderate level of use on allotments in fair or good erosion condition.

Impacts to critical erosion areas would continue as described in the initial action except for those within the New Canyon Allotment. Critical erosion areas within this allotment are proposed for vegetation treatment. Possible impacts to these areas are discussed below under vegetation treatments.

Vegetation Treatments

Increased soil erosion is anticipated to occur on the 5,072 acres proposed for burning for at least 1 and perhaps 2 years after treatment. This would occur as a result of exposing large amounts of bare soil to the erosive effects of summer rain storms while the newly seeded plants were becoming established. Such storms cause most of the floodwater damage, surface erosion, and arroyo formation on western range lands (Branson et al., 1975).

These short-term increases in erosion could become worse, both in duration and intensity, if the newly seeded plants failed to mature properly. In order to determine the probability of this occurring, the SCS interim guide for rating soils for their seeding suitability was used (Chapter 2). A successful seeding was assumed to increase ground cover and provide the projected number of AUMs indicated in Appendix 4.

Since complete soils data are available on only seven of the 14 allotments (14,994 acres or 13 percent of the area), soils analysis will necessarily be based on this limited sample. Within the seven allotments sampled, all but 4 percent (561 acres) contained big sagebrush in the natural composition and were considered typical of the areas to be treated.

Table 3-2 provides a graphic presentation of the base data used in determining chances of a successful seeding on the seven allotments. Fifteen percent of the soils have a 70-percent or better chance of seeding success; 54 percent have a 50-percent chance of seeding success, and 31 percent have a 30-percent or less chance of seeding success. The overall chance of success for any randomly selected acreage would be 46.8 percent. A tabulation of the acres affected is included in the Conclusion section which completes this impact discussion.

Thus, it appears quite likely that the short-term increases in erosion noted above would increase both in duration and intensity. The severity of the impact would depend on the degree of seeding failure experienced on a particular area. However, even if a complete seeding failure occurred, natural reestablishment of vegetation to pretreatment cover levels would occur within at least 5 years. Such a situation would not reduce present erosion rates, but merely return them to pretreatment levels.

Research information on the hydrologic relations of spraying sagebrush compiled by Sturges (1975) indicates that the loss of the sagebrush canopy is offset by the increased basal area of herbaceous species. In the example noted by Sturges (1975), litter cover increased slightly and rock and base soil decreased after spraying a high-elevation stand

TABLE 3-2

Chance of Seeding Success

	Risk of Failure (acres)			Weighted Average Percent Risk	Total Acres
Allotment	High	Medium	Low		
Bear Lake	661	537	0	.61	1,198
Dry Basin	17	1,421	1,343	.40	2,781
Kearl	266	917	0	.54	1,183
Laketown	1,949	1,292	0	.62	3,241
Stuart	45	342	655	.38	1,042
Twin Peaks	747	1,341	204	.55	2,292
Rabbit Creek	1,025	2,232	0	.56	3,257
TOTALS	4,710	8,082	2,202	...	14,994
PERCENT OF TOTAL	(31)	(54)	(15)	...	......

Source: Interpreted from tables 2-2 Acres of Range Site by Allotment and table 2-3 Range Site Suitability Rating.

SCS Percent Risk Factors

HIGH: 70 percent MEDIUM: 50 percent LOW: 30 percent

of sagebrush. Based on this information, erosion would not be expected to increase as a result of the proposed spraying of 60,115 acres of land.

A long-term reduction in soil erosion is expected to occur on those areas either burned or sprayed where a successful seeding would be established (Lusby, 1978).

The impacts to soils from the application of 2,4-D would be of short duration since the herbicide is quickly degraded in 2 to 6 weeks and does not accumulate in the soil. By-products from 2,4-D degradation are carbon dioxide, water, and chlorine. The leaching of 2,4-D in the soil is a slow process and seldom penetrates more than a few inches into the soil (Vegetation Management with Herbicides in the Eastern Region, Final Environmental Statement, USDA Forest Service, 1978).

Projects

Development of wells, pipelines, and fences would cause soil impacts. It is anticipated that approximately 116 surface acres of soil would be affected by these projects. Within the area of influence, the soil would be subject to compaction, lowered utilization rates, and increased runoff. Erosion within these areas would probably be increased where livestock congregate and where seedings were unsuccessful.

Summary

Tables 3-3 and 3-4 indicate the most probable impacts to soil erosion as discussed above. In addition, the consequences to soil erosion of these possible levels of impact are also shown. Scenario A assumes that vegetation treatments are limited to soils with a 50-percent or greater chance of success. Scenario B assumes all the proposed seeding would fail and scenario C assumes all the proposed seedings would be successful. As noted in table 3-4, the range of possible impacts is considerable. For example, decreased soil erosion could occur on 72,413 acres or on 7,226 acres, depending on the degree of seeding success. The anticipated shift in vegetation composition within seven allotments as reported in the Vegetation section, should not increase soil erosion since total plant cover would not change. In fact, deferring livestock use until later in the season would increase plant cover protecting the soil during the critical summer rainstorm period 4 years out of 6.

Conclusion

Implementing the proposed action would result in reducing soil erosion on 37,734 acres and increasing soil erosion on 506 acres. Existing erosion conditions would continue on 96,741 acres and 5,317 acres would experience unknown impacts. A short-term (1 to 5 years) increase in soil erosion would occur on 5,072 acres proposed for burning.

The streambank sloughing problem would be corrected on 8 miles of stream. Declining erosion trends would be halted on two allotments and

TABLE 3-3

Summary of Initial Impacts to Soils

Allotment	Areas Affected by Erosion Less	 No change	 Unknown[a]
DISPOSAL			
Middle Ridge	......	1,286	.....
Session	......	238	.....
CONTINUE INITIAL ACTION MANAGEMENT			
Eastman	......	3,325	80
Deseret	......	15,367	190
South Woodruff	......	4,251	.....
IMPROVED MANAGEMENT			
Bear Lake	......	1,118	80
Big Creek	20,025	....	321
Dry Basin	......	2,781	.....
Duck Creek	......	13,250	160
East Woodruff	......	2,167	.....
Kearl	......	1,183	.....
Laketown	23	3,218	.....
Meachum Canyon	......	1,951	.....
New Canyon	97	30,350	218
Rabbit Creek	......	3,257	.....
Sage Creek	......	10,128	25
Stuart	......	1,042	.....
Twin Peaks	29	2,263	.....
Woodruff Pastures	......	21,855	20
TOTALS	20,174	119,030	1,094

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[a] Contains land disposals and recreation site developments.

TABLE 3-4

Summary of Long-Term Impacts to Soils

Allotment	Acres Affected by Erosion Less[a]	No change	More	Unknown[a]
DISPOSAL				
Middle Ridge	......	......	...	1,286
Session	......	......	...	238
CONTINUE INITIAL ACTION MANAGEMENT				
Eastman	......	3,325	...	80
Deseret	......	15,367	...	190
South Woodruff	......	4,251	...	......
IMPROVED MANAGEMENT				
Bear Lake	278	837	3	8
Big Creek	11,930	7,028	16	1,372
Dry Basin	1,067	1,702	12	0
Duck Creek	7,391	5,373	19	627
East Woodruff	181	1,981	5	0
Kearl	224	952	7	0
Laketown	127	3,097	13	4
Meachum Canyon	729	828	394	0
New Canyon	4,818	25,559	17	271
Rabbit Creek	1,487	1,765	5	0
Sage Creek	2,721	7,304	10	118
Stuart	351	550	1	140
Twin Peaks	402	1,890	...	0
Woodruff Pastures	6,028	14,932	4	911
TOTALS	37,734	96,741	506	5,317
Scenario A: Vegetation treatment on soils with a 50-percent or greater chance of success.	40,885	94,179	859	4,375
Scenario B: All seedings fail	7,226	124,876	5,578	2,618
Scenario C: All seedings are successful	72,413	64,761	506	2,618

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[a] A reduction in erosion rates is assumed for only 46.8 percent of the treated acres under the proposed action and 55 percent for Scenario A. The remaining acreage to be burned is given under the unknown heading as the degree of success or failure is unknown.

the rate of decline reduced in six allotments. The erosional condition would be improved on 832 acres of land in a critical erosion condition.

IMPACTS TO VEGETATION

Introduction

Impacts to vegetation are analyzed in two components: impacts arising from the initial action and impacts from long-term management actions. A step by step analysis of cause-effect relationships, in which specific elements of the proposed action were analyzed for their impact to vegetation, was performed in a systematic way for each allotment. An example of how this analysis was performed is contained in Appendix 16. The following highlights the results of this analysis.

Initial Action

Proposed initial action management would impact vegetation in the following ways:

1. Proposed range readiness turn-on would result in a change in the present fixed turn-on dates. A change to a variable date estimated between 5/15 and 6/1 each year may be earlier or later than the present date, depending on the allotment. However, this change in turn-on date is expected to be slight when compared to the present situation. In most cases, the present turn-on date may be delayed 5 days or less to accommodate range readiness turn-on. The June 1 turn-on date would be better than the present situation, but if the range was not ready at that time, it could still be too early.

The proper phenological stage may be reached as much as 8 days after the 6/1 cutoff date (Stoddart et al., 1975). This could cause grazing to occur too early in some years due to normal climatic factors (8 days amounts to approximately 9 percent of the growing season). This too-early grazing could result in depleted carbohydrate reserves in desirable plants (Cook, 1966). The proposed phenological stage of range readiness (7-inch height of bluebunch wheatgrass) also corresponds with the most vulnerable stage of the plant to grazing, i.e., a minimum amount of food storage in the roots (Mason, 1963; McIlvanie, 1942) which is considered to be the most vulnerable state in the development of the grass. It was also shown that clipping at this stage (simulating grazing) prolonged and intensified the vulnerable period of the plant. Since, as pointed out in Stoddart et al., (1975), grazing animals tend to seek out and regraze plants that were previously grazed, it is conceivable that the same preferred species would be repeatedly grazed, leaving them with very low levels of carbohydrate reserves. Mueggler (1975) indicates that 6 to 8 years of protection from grazing may be required to restore low vigor bluebunch wheatgrass plants to normal vigor.

2. Proposed adjustments in the level of livestock use would impact vegetation. Reductions in the existing level of use could result in positive impacts providing the utilization rates by all herbivores did not exceed the total proper allowable use.

Initial Adjustment in Livestock Use

The timeframe used for analysis is from the time of implementation of the initial action (30 days after filing of the final ES) to the time of the implementation of the long-term actions (as much as 5 years later).

Categories of Vegetation Impacts

Livestock Forage Condition

Forage condition can be affected when the relative proportion of desirable species in the overall plant community is changed. It is not anticipated that the initial action would cause any changes in livestock forage condition classes from the present situation because of the very slight reduction of livestock grazing and variable turn-on dates being offset by the short time period (5 to 6 years) of the initial action and the June 1 turn-on date limitation. For allotment by allotment data on livestock forage condition, see table 3-5.

TABLE 3-5

Initial Impacts to Vegetation Resource Categories

Allotment	Livestock Forage Condition (acres)	Present		Predicted		Apparent Trend (acres)			Desirable Plant Vigor		Percent Livestock Utilization Key Species (grass)		Composition and Density		
		Cattle	Sheep	Cattle	Sheep		Present	Pre-dicted	Present	Pre-dicted	Present[a]	Pre-dicted		Present	Predicted
Bear Lake[b]	Good	667	1,138	627	1,058	Up	662	635	Fair	Fair	59	55	Density	38	No change
	Fair	471	0	431	0	Static	155	129					Grass	30	No change
	Poor	0	0	0	0	Down	321	294					Forb	10	No change
	Unsuitable	60	60	60	60	Unsuitable	60	60					Shrub	60	Increase
Big Creek[b]	Good	6,718	13,404	6,611	13,243	Up	0	0	Poor	Poor	65	54	Density	44	No change
	Fair	10,927	4,345	10,817	4,185	Static	10,256	10,095					Grass	25	No change
	Poor	104	0	0	0	Down	7,493	7,333					Forb	10	No change
	Unsuitable	2,597	2,597	2,597	2,597	Unsuitable	2,597	2,597					Shrub	65	No change
Deseret	Good	7,306	11,240	7,211	11,145	Up	1,567	1,504	Fair	Fair	23	29	Density	31	No change
	Fair	7,104	3,170	7,009	3,075	Static	11,103	11,039					Grass	42	Decrease
	Poor	0	0	0	0	Down	1,740	1,677					Forb	8	Increase
	Unsuitable	1,147	1,147	1,147	1,147	Unsuitable	1,147	1,147					Shrub	50	Increase
Dry Basin	Good	2,715	2,715	2,715	2,715	Up	0	0	Fair	Fair	26	28	Density	42	No change
	Fair	0	0	0	0	Static	2,715	2,715					Grass	29	Decrease
	Poor	0	0	0	0	Down	0	0					Forb	14	Increase
	Unsuitable	66	66	66	66	Unsuitable	66	66					Shrub	57	Increase
Duck Creek[b]	Good	229	12,248	176	12,168	Up	0	0	Fair	Fair	66	61	Density	44	No change
	Fair	12,022	1,089	11,968	1,009	Static	12,944	12,864					Grass	15	No change
	Poor	1,086	0	1,033	0	Down	393	313					Forb	11	No change
	Unsuitable	73	73	73	73	Unsuitable	73	73					Shrub	74	No change
Eastman[b]	Good	142	2,603	116	2,563	Up	547	521	Fair	Fair	55	53	Density	38	No change
	Fair	1,823	738	1,796	698	Static	579	552					Grass	12	No change
	Poor	1,376	0	1,349	0	Down	2,215	2,188					Forb	15	No change
	Unsuitable	64	64	64	64	Unsuitable	64	64					Shrub	73	No change
East Woodruff	Good	777	2,167	777	2,167	Up	62	62	Fair	Fair	19	19	Density	29	No change
	Fair	1,390	0	1,390	0	Static	2,105	2,105					Grass	46	No change
	Poor	0	0	0	0	Down	0	0					Forb	10	No change
	Unsuitable	0	0	0	0	Unsuitable	0	0					Shrub	44	No change
Kearl	Good	558	1,183	558	1,183	Up	543	543	Fair	Fair	54	19	Density	44	No change
	Fair	625	0	625	0	Static	640	640					Grass	13	No change
	Poor	0	0	0	0	Down	0	0					Forb	14	No change
	Unsuitable	0	0	0	0	Unsuitable	0	0					Shrub	73	No change

(continued)

TABLE 3-5 (continued)

Allotment	Livestock Forage Condition (acres)	Present		Predicted		Apparent Trend (acres)			Desirable Plant Vigor		Percent Livestock Utilization Key Species (grass)		Composition and Density		
		Cattle	Sheep	Cattle	Sheep		Present	Pre-dicted	Present	Pre-dicted	Present[a]	Pre-dicted		Present	Predicted
Laketown	Good	1,309	2,445	1,309	2,445	Up	1,445	1,445	Good	Good	45	48	Density	43	No change
	Fair	1,136	0	1,136	0	Static	1,079	1,079					Grass	15	Decrease
	Poor	79	79	79	79	Down	0	0					Forb	10	Increase
	Unsuitable	717	717	717	717	Unsuitable	717	717					Shrub	75	Increase
Meachum Canyon	Good	383	1,604	383	1,604	Up	812	812	Good	Good	14	21	Density	33	No change
	Fair	1,447	226	1,447	226	Static	1,018	1,018					Grass	29	No change
	Poor	0	0	0	0	Down	0	0					Forb	7	No change
	Unsuitable	121	121	121	121	Unsuitable	121	121					Shrub	64	No change
Middle Ridge	Good	0	1,286	0	1,286	Up	1,178	1,178	Good	Good	12	24	Density	35	No change
	Fair	993	0	993	0	Static	108	108					Grass	22	No change
	Poor	293	0	293	0	Down	0	0					Forb	8	No change
	Unsuitable	0	0	0	0	Unsuitable	0	0					Shrub	70	No change
New Canyon[b]	Good	18,813	28,872	18,740	28,654	Up	973	901	Fair	Fair	59	59	Density	38	No change
	Fair	9,860	0	9,787	0	Static	6,656	6,583					Grass	24	Decrease
	Poor	199	0	127	0	Down	21,243	21,170					Forb	12	Increase
	Unsuitable	1,793	1,793	1,793	1,793	Unsuitable	1,793	1,793					Shrub	64	Increase
Rabbit Creek	Good	20	3,191	20	3,191	Up	0	0	Fair	Fair	37	37	Density	37	No change
	Fair	3,171	0	3,171	0	Static	3,191	3,191					Grass	24	Decrease
	Poor	0	0	0	0	Down	0	0					Forb	10	Increase
	Unsuitable	66	66	66	66	Unsuitable	66	66					Shrub	66	Increase
Sage Creek[b]	Good	1,055	9,081	1,042	9,056	Up	1,071	1,059	Fair	Fair	51	52	Density	44	No change
	Fair	8,026	0	8,014	0	Static	8,010	7,997					Grass	20	Decrease
	Poor	0	0	0	0	Down	0	0					Forb	13	Increase
	Unsuitable	1,072	1,072	1,072	1,072	Unsuitable	1,072	1,072					Shrub	67	Increase
Session	Good	0	238	0	238	Up	0	0	Fair	Fair	50	50	Density	26	No change
	Fair	238	0	238	0	Static	238	238					Grass	7	Decrease
	Poor	0	0	0	0	Down	0	0					Forb	6	Increase
	Unsuitable	0	0	0	0	Unsuitable	0	0					Shrub	87	Increase
South[b] Woodruff	Good	101	1,106	101	1,106	Up	5	5	Fair	Fair	74	63	Density	35	No change
	Fair	2,625	2,640	2,625	2,640	Static	2,220	2,220					Grass	18	No change
	Poor	1,173	153	1,173	153	Down	1,674	1,674					Forb	8	No change
	Unsuitable	352	352	352	352	Unsuitable	352	352					Shrub	74	No change
Stuart	Good	291	1,005	291	1,005	Up	0	0	Poor	Poor	55	32	Density	29	No change
	Fair	366	0	366	0	Static	132	132					Grass	12	Increase
	Poor	348	0	348	0	Down	873	873					Forb	13	Decrease
	Unsuitable	37	37	37	37	Unsuitable	37	37					Shrub	75	Decrease

(continued)

TABLE 3-5 (concluded)

Allotment	Livestock Forage Condition (acres)					Apparent Trend (acres)			Desirable Plant Vigor		Percent Livestock Utilization Key Species (grass)		Composition and Density		
		Present		Predicted											
		Cattle	Sheep	Cattle	Sheep		Present	Pre- dicted	Present	Pre- dicted	Present[a]	Pre- dicted		Present	Predicted
Twin Peaks	Good	1,869	2,292	1,869	2,292	Up	500	500	Fair	Fair	30	38	Density	52	No change
	Fair	423	0	423	0	Static	1,792	1,792					Grass	31	No change
	Poor	0	0	0	0	Down	0	0					Forb	7	No change
	Unsuitable	0	0	0	0	Unsuitable	0	0					Shrub	62	No change
Woodruff Pastures	Good	9,293	15,256	6,661	12,621	Up	1,159	1,152	Fair	Fair	60	50	Density	29	No change
	Fair	6,225	2,708	8,843	5,323	Static	10,870	10,863					Grass	35	Increase
	Poor	2,446	0	2,440	0	Down	5,935	5,929					Forb	10	Decrease
	Unsuitable	3,911	3,911	3,911	3,911	Unsuitable	3,911	3,911					Shrub	55	Decrease
SUB TOTALS	Good	52,246	113,074	49,207	109,740	Up	10,524	10,317							
	Fair	68,872	14,916	71,079	17,156	Static	75,811	75,360							
	Poor	7,104	232	6,842	232	Down	41,887	41,451							
	Unsuitable	12,076	12,076	12,076	12,076	Unsuitable	12,076	12,076							
TOTALS		140,298	140,298	139,204	139,204		140,298	[a]139,204							

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[a] Includes undetermined amount of wildlife utilization.

[b] Livestock forage production is expected to decrease 5 percent on these allotments due to high utilization rates.

Apparent Trend

Apparent trend is a single point in time measurement of vegetation trends. It relies on the following factors: vigor of desirable species, establishment of desirable seedlings, formation of gully erosion, and movement of surface litter by erosional forces. Therefore, any influences which affect any one or a combination of these factors would have an impact on apparent trend.

It is not anticipated that the present apparent trends on the various allotments would be changed measurably by the initial action. Although reductions in livestock use are proposed in nine allotments, on six allotments this reduction results in livestock utilization remaining 50 percent or greater. Therefore, existing trends would continue. On those allotments with increases in livestock use, small increases in utilization rates would occur and apparent trend would not be expected to change since subsequent forage utilization would be well within the 50 percent level. Table 3-5 identifies allotments, trend, and vigor projections.

Composition and Density

Composition is the relative proportion of different plant types - forbs, grasses, shrubs - in a population. Density is the percent of the land surface area covered by live vegetation. Several things can affect the composition and density in stands of vegetation, including climax vegetation types, grazing intensity, timing of grazing, vegetation treatments, etc. Some literature indicates that too-early grazing may eventually cause a shift in composition toward undesirable species (Cook, 1966). The proposed turn-on dates would not measurably change the vegetation composition because the variable turn-on date would be based on range readiness and the short time frame of the initial action would not be long enough to cause measurable change. It has also been found that it is unlikely grazing management alone, without vegetation treatments would be sufficient to improve forage yields on sagebrush types by causing changes in composition (Pechanec et al., 1965; table 3-5).

Utilization of Key Species

The utilization of key species refers to the amount of current year's annual plant production on certain indicator or key species consumed by both domestic and wild animals. Such factors as relative abundance of key species in the plant community, number of animals using the area, and the duration of their use all affect the level of utilization. Overutilization (in excess of 50 to 60 percent of annual growth) of preferred forage year after year will weaken and eventually remove preferred forage from the composition because of the loss of carbohydrate reserves (Stoddart et al., 1975; McIlvanie, 1942) losses of live root mass (Cook, 1966) and reduction of plant vigor as measured by herbage weight and seed stalk production (Mueggler, 1975). The initial action would have both positive and negative impacts on utilization, depending on whether AUM levels are decreased or increased (respectively) in specific allotments. Due to the assignment of desirable competitive forage species to livestock and not deer, overutilization of these species would occur. The overutilization of forage was apparently made as a result of the method used to assign forage. Forage was assigned on a priority basis. Cattle received first priority, sheep were second, and deer received what forage remained (Appendix 6). Further, forage assigned to cattle and sheep were based upon the greatest seasonal dietary preference (proper use factor [PUF]). As an example, cattle have a spring PUF of 40 and a summer PUF of 50 on bluebunch wheatgrass (*Agropyron spicatum*). Therefore, cattle were assigned bluebunch wheatgrass based upon a PUF of 50. Following the process outlined in Appendix 6, and applying it to bluebunch wheatgrass, forage was assigned thus:

Bluebunch wheatgrass total allowable PUF = 50 percent
Cattle proper use factor = -50 percent
Remainder for other animals = 0 percent
Sheep proper use factor = 50 percent
Deer proper use factor = 15 percent
(-65) percent

As can be seen, there are no AUMs of this species available assigned to sheep or deer. This process maximizes forage for cattle and sheep and severely limits the quality and quantity of forage for deer. Prime examples of this are represented by mountain dandelion (*Agoseris glauca*), an important summer forage species, and bitterbrush, the most important fall and winter forage for deer in terms of nutrition and preference:

	Mountain Dandelion	Bitterbrush
Total allowable PUF	= 50 percent	50 percent
Cattle PUF	= -30 percent	-30 percent
Remainder for other animals	= 20 percent	20 percent
Sheep PUF	= -30 percent	-30 percent
Insufficient forage for sheep	= (10) percent	(10) percent
Remainder for other animals	= 0 percent	0 percent
Deer PUF	= 40 percent	50 percent
No forage allocated to deer	= -40 percent	-50 percent
Total insufficient forage	=(-50) percent	(-60) percent

During the forage allocation process, deer rarely received any forage from their preferred species, but were assigned forage based upon those less desirable species such as big sagebrush (*Artemesia tridentata*).

Cattle and sheep have low preference for big sagebrush. Therefore, only a small amount of sagebrush, if any, would have been assigned to livestock; their forage would come from the nonsagebrush portion. This would leave the bulk of the big sagebrush portion of the forage for deer. Deer, however, cannot live on sagebrush alone, as they require a wide variety of browse and forbs (BLM Man. Tech. Supp. 6601-6). The deer would use only minor amounts of the sagebrush and would consume forage assigned to livestock, resulting in overuse of forage species preferred by livestock and deer. Due to the 40-percent dietary overlap between highly preferred competitive livestock and wildlife forage such as bitterbrush (Purshia tridentata), utilization on these species would amount to 80 to 100 percent of the yearly growth. On those allotments where livestock utilization is proposed in excess of 50 percent, it is highly probable that utilization would exceed 1 year's annual growth and eventually in the case of bitterbrush, it would die off.

These impacts would be compounded because the livestock would be allowed to graze the fall and critical deer winter ranges before the deer. Critical deer winter range on Meachum Canyon and Deseret Allotments would receive even more grazing pressure from major increases (33 and 21 percent, respectively) in livestock grazing levels (Appendix 4). This would be most adverse on four allotments in the initial action:

Bear Lake	Eastman
Big Creek	South Woodruff

These allotments have present forage utilization rates on key forage species in excess of 50 percent (average of 63 percent). Although all four of the allotments are proposed for livestock reductions in the initial action, overuse of desirable forage would still occur. Forage utilization by livestock of key forage species would would still average 56 percent. Since all of these four allotments contain critical deer winter range, it is likely that use in excess of 70 to 80 percent would result on desirable species preferred by livestock and wildlife.

Duck Creek, Sage Creek, and New Canyon also have existing utilization rates of 66, 51, and 59 percent, respectively. Even with proposed reductions, livestock forage utilization would be 61, 52, and 59 percent, respectively. In addition, seasonal deer forage demands would cause these rates to increase to 60 to 70 percent due to a 40-percent dietary overlap.

The result of both of these situations would be that existing vegetation condition classes and trends would continue and vigor would decline. A slightly different situation would exist on:

Dry Basin	Middle Ridge
Deseret	Twin Peaks
Meachum Canyon	

These five allotments are proposed for increases in livestock use in the initial action; increases range from 8 to 96 percent. The overall effect on livestock forage utilization would range from 19 to 38 percent. Even with deer use on top of this, utilization rates would probably not exceed 50 percent or be high enough to result in noticeable changes to vegetation condition classes, trends, or vigor in the initial action.

Livestock Forage Production

The initial action would result primarily in a no change to modest (5 percent or less) overall decrease in AUMs of forage production initially allocated to livestock (Appendix 4). This is primarily the result of the existing stocking level being in excess of what is considered to be proper utilization of forage species (50 percent on grasses, 60 percent on shrubs). This would occur on seven allotments containing 83,428 acres.

Riparian Vegetation

The above discussion does not apply to the riparian areas totaling 208 acres to be fenced in four allotments. Impacts to these fenced riparian areas are anticipated to be as follows:

1. Woody streamside vegetation (willows and alders) would increase.
2. As woody streamside vegetation increased shade over the stream, water temperatures would lower.
3. Herbaceous vegetation would increase in density and vigor. Forage and cover for wildlife would increase.
4. Streambank sloughing would be reduced and "U" shaped undercut streambanks would develop.
5. Where fencing occurs in headwaters, the streambottom gravel strata would develop sufficiently for colonies of preferred macroinvertebrates.

Impacts to the remaining 823 acres of riparian vegetation not proposed for livestock exclusion would continue with a predominance of grass, invasion of sagebrush (URA Step 3), and native shrub species (willows) would comprise only a very small proportion of the vegetation composition. Apparent trend, vigor, production, and condition would not change; existing poor values would continue. For additional analysis of impacts to riparian vegetation, see Chapter 3, Impacts to Fisheries Habitat.

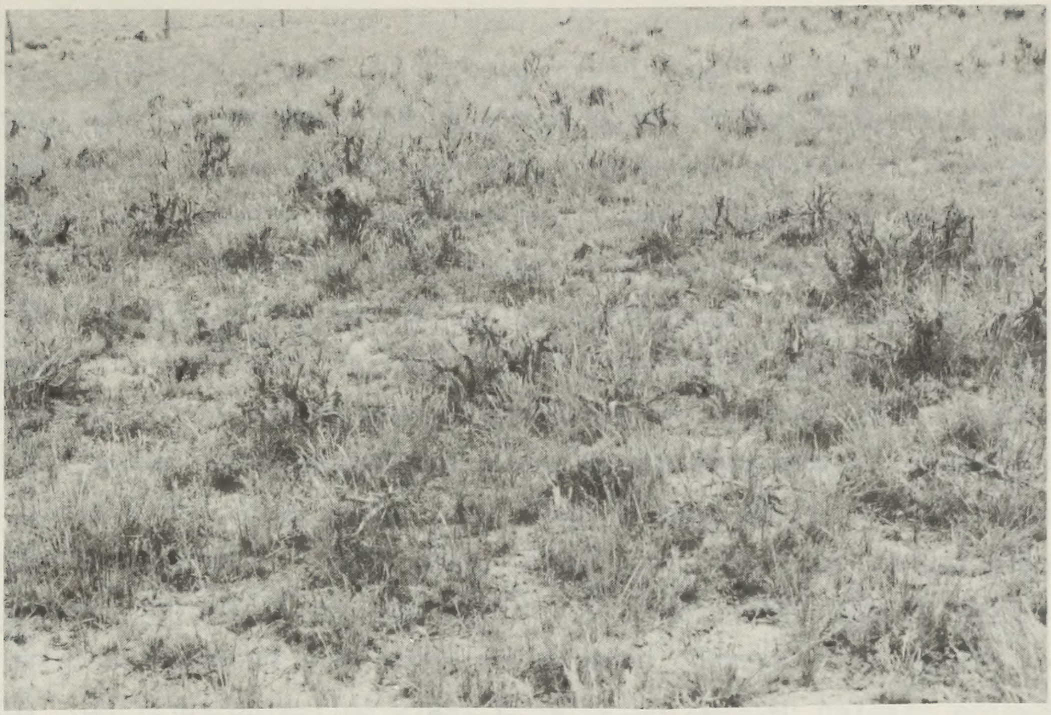
Long-Term Management Actions

Introduction

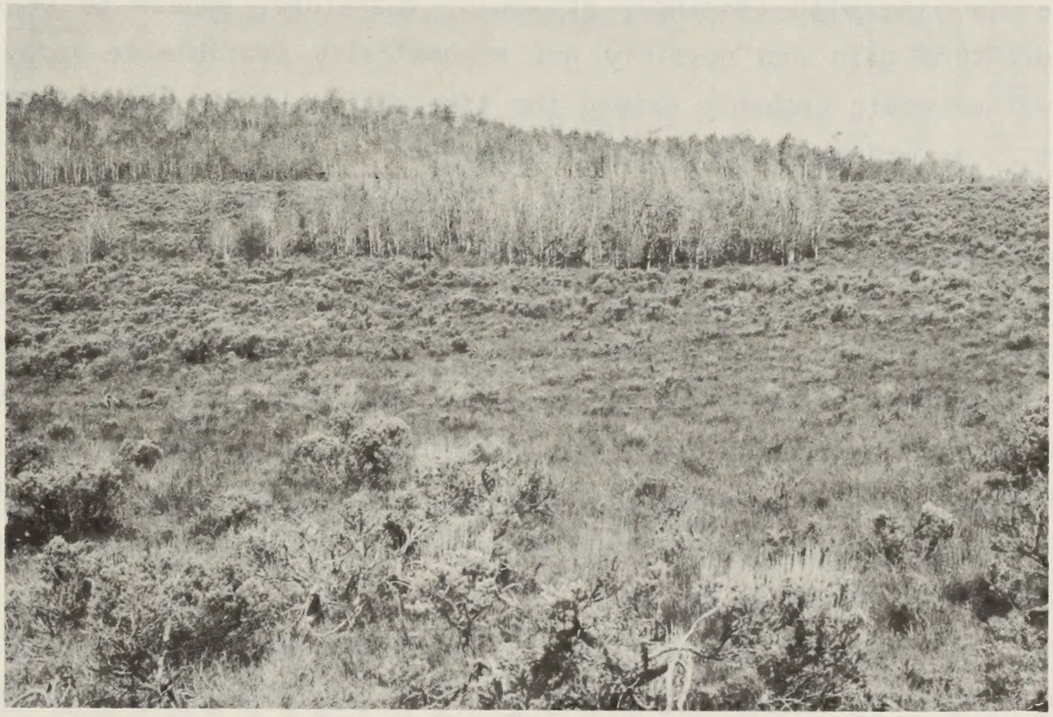
Implementation of the proposed livestock grazing and resting treatments would provide periodic rest from livestock grazing to key forage species. Only four allotments on 28,285 acres (those presently having grazing systems), provide rest under the initial action. Long-term management would provide rest to an additional 13 allotments. Where rest is provided to a portion of the allotment each year (Appendix 5), positive impacts to vegetation would occur, allowing grass seed production, and establishment of seedlings (Hormay, 1958). With the proposed grazing treatments, each pasture would receive rest during the spring growing period (until 6/30) at least 1 year in 3. At least 1 year in every 5, grazing would be deferred until seed ripe (7/31). Utilization by livestock would be limited not to exceed 50 percent on grass and 60 percent on browse.

Proposed vegetation treatments would impact vegetation by changing the composition from sagebrush type to grass type (fig. 3-1). Vegetation would be removed by spraying and/or burning followed by seeding of desirable forage species for livestock and wildlife.

Vegetation treatment (whether by fire or chemical means) would destroy much of the existing vegetation in the treated area. Nielsen and Hinckley (1975) reported that a 67 to 100 percent kill could be expected on big sagebrush (*Artemesia tridentata*) if proper recommendations for use of fire are followed. Data in Valentine (1971) and Linne (1978) indicate that at least 3 years would be required to restore normal production to many desirable forage species following fire. Appendix 16, table 1, gives the effects of fall burning on various species. Linne (1978) also presents data that rabbitbrush may increase as much as nine times over preburn levels following a fire. Valentine



LAND TREATMENT – NOTE DEAD OR DYING BIG SAGEBRUSH AND VIGOROUS PERENNIAL GRASS REPLACING THE SAGEBRUSH



LAND TREATMENT (2,4–D SPRAYING) IN FOREGROUND

FIGURE 3– 1

RANGE DEVELOPMENTS

(1971) cites a study showing that chemical application of 2,4-D caused a high proportion of rabbitbrush plants to sprout profusely and also stated, "Eradication of large acreages of undesirable range plants by herbicides is seldom possible." The application of 2,4-D may adversely affect some nontarget plants. In the Randolph ES area, the application of 2,4-D is expected to greatly reduce forbs and shrubs, but have little impact on grasses. Immediately following the application of the herbicide, there would be a partial to complete reduction of competitive species. This would allow individual grass plants to increase in size and numbers. Although there would be substantial reduction in the composition of forbs and shrubs, they would begin to recover toward pretreatment levels in the first year after treatment. Nielsen and Hinckley (1975) reported in a 7 to 9-inch precipitation zone at 6,800 feet elevation in Wyoming (similar to Randolph), benefits as a result of spraying started decreasing after 5 years following spraying. After 14 years, benefits from treatments were negligible and after 17 years, the big sagebrush was more dense than before treatment. Without following the spraying with seedings, it would, therefore, appear to be only a short-term gain and possibly not economically feasible to spray. The seedings would probably extend the time available for livestock forage, but it is not known for how much longer.

The Soils section of Chapter 3 indicates that soils in the big sagebrush types are low in moisture-holding capacity and, therefore, the seedings on 65,187 acres have only a 46.8-percent chance of being successful in terms of proposed forage production (11,913 AUMs). Vegetation analysis assumes this would occur and, therefore, only 5,598 AUMs would be realized (table 3-6). Limiting seedings to soils having a 50-percent or better chance of seeding success, the areas to seed would be reduced to 50,429 acres and 55 percent of proposed forage production (6,522 AUMs) would be possible.

The timeframe used for analysis would be from the implementation of the long-term management actions until 20 years thereafter. No impacts were predicted in the long term to the Middle Ridge or Session

TABLE 3-6

Comparison Between Proposed and Predicted Livestock AUMs

	PROPOSED LIVESTOCK AUMS (Appendix 6)					PREDICTED LIVESTOCK AUMs					
		AUM Increase						AUM Increase			
Allotment	Initial AUMs	Management	Treatment	Water Devel-opments	Total	Initial AUMs	Over-obligation	Management	46.8 Percent Successful Treatment	Water Devel-opments	Total
DISPOSAL											
Middle Ridge	202	0	0	0	202	202	0	0	0	0	202
Session	40	0	0	0	40	40	0	0	0	0	40
CONTINUE INITIAL ACTION MANAGEMENT											
Deseret	3,062	0	0	0	3,062	3,062	0	0	0	0	3,062
Eastman	612	0	0	0	612	612	0	0	0	0	612
South Woodruff	314	0	0	0	314	314	0	0	0	0	314
IMPROVED MANAGEMENT											
Bear Lake	140	0	10	0	150	140	0	0	4	0	144
Big Creek	3,116	0	2,985	393	6,494	[a]3,116	(231)	0	1,397	393	4,675
Dry Basin	510	0	104	0	614	510	0	0	62	0	572
Duck Creek	1,745	0	2,649	0	4,394	[a]1,745	(315)	0	1,240	0	2,670
East Woodruff	179	0	107	0	286	179	0	0	50	0	229
Kearl	176	0	32	0	208	176	0	0	15	0	191
Laketown	296	0	4	75	375	296	0	0	2	75	373
Meachum Canyon	393	38	91	23	545	393	0	38	43	23	497
New Canyon	4,835	0	2,918	0	7,753	[a]4,835	(738)	0	1,366	0	5,463
Rabbit Creek	486	0	248	0	734	486	0	0	109	0	595
Sage Creek	1,043	0	896	187	2,126	[a]1,043	(40)	0	419	187	1,609
Stuart	60	0	114	0	174	60	0	0	71	0	131
Twin Peaks	316	0	73	0	389	316	0	0	33	0	349
Woodruff Pastures	4,825	0	1,682	504	7,011	[b]4,825	(2,448)	0	787	504	3,668
TOTALS	22,350	38	11,913	1,182	35,241	22,350	(3,772)	38	5,598	1,182	25,396

[a] Initial stocking levels overobligated due to utilization restriction of 50 percent on grasses and 60 percent on browse.

[b] Initial stocking level overobligated due to utilization restriction, rest requirement, and interseeding of the Dry Basin Pasture.

Allotments since public lands in these two allotments are scheduled for disposal before the long-term actions begin. No additional impacts other than those from the initial action were predicted for the Deseret, Eastman, and South Woodruff Allotments, since the management from the initial adjustment in livestock use would be carried forward without change into the long term.

The following discussion of impacts applies to all allotments with the exception of those named above.

Impacts to vegetation from the proposed long-term management would be influenced by the effects of the initial action on vegetation. For this portion of the analyses, specific impacts to each of the resource categories analyzed under the initial action were considered as the basis for the long-term analysis.

Categories of Vegetation Impacts

Livestock Forage Condition

Long-term actions may effect improvements or declines in forage condition, depending on the specific allotment involved. Those allotments scheduled for vegetation treatments by burning would show an initial decline in condition for at least 2 years, but should then improve to at least pretreatment levels because burning removes most of the vegetation and litter. Until the seedings become established, only annual grasses and forbs would be available as forage. The effects of spraying on vegetation condition would not be as disturbing; condition would improve following treatment because the spraying would not kill grass or remove standing shrubs or litter, holding the soil, shading seedings, and leaving a residual vegetation stand of grass free from competition with the big sagebrush. It is not anticipated that treatments would show dramatic permanent improvements over pretreatment livestock forage condition due to the inherent risk of seeding failures, the reinvasion by less desirable species and insufficient rest to the seedings. On untreated sites, the literature indicates that relatively slow rates of recovery can be expected on range sites in poor condition, even under complete rest for 20 years and more (McLean and Tisdale, 1972). Therefore, no improvement is expected. For allotment by allotment data on livestock forage condition, see table 3-7.

Apparent Trend and Plant Vigor

It is not anticipated that present vigor on the various allotments would be changed measurably by long-term management actions because the amount of rest allowed by the grazing and resting treatments would be offset by the increased intensity of use proposed. The literature indicates that a plant's vigor may recover very slowly once it has been depressed to a moderately low level: 6 to 10 years of complete rest from grazing may be required to restore full vigor in bluebunch wheatgrass (Mueggler, 1975). Vigor, a major factor in apparent trend, is only one factor in determining trend. The other factors should improve resulting in some trend improvement under the proposed management. For specific data on the apparent trend in each allotment, refer to table 3-7.

Composition and Density

The major changes in vegetation composition would result from the proposed land treatment - spraying or burning and seeding 65,187 acres. On areas where these treatments are successful, the vegetation composition would be 65 percent grasses, 10 percent forbs, and 35 percent browse. On critical deer winter ranges, the composition would be 50 percent grasses, 10 percent forbs, and 40 percent browse.

On areas where vegetation treatments fail, the composition could change to annuals, forbs, and undesirable, highly competitive species.

Utilization of Key Species

A limit of 50 percent utilization on grasses, 60 percent utilization on browse, and additional rest on Dry Basin Pasture (Woodruff Pastures Allotment) would result in an overobligation of 3,772 AUMs on Big Creek, Duck Creek, New Canyon, Sage Creek, and Woodruff Pastures Allotments (table 3-6). Also, the problem of overutilization of competitive forage between wildlife and livestock in the initial action would continue because as livestock are removed after 50 to 60 percent utilization, deer would move in and overutilize key forage species an

TABLE 3-7

Long Term Impacts to Vegetation (Compared to Initial Action Impacts on Table 3-5)

Allotment	Livestock Forage Condition (Acres)		Apparent Trend (Acres)	Desirable Plant Vigor	Percent Livestock Utilization of Key Species	Composition and Density
	Cattle	Sheep				
Bear Lake	No change	No change	Up Increase to 764 Static Increase to 294 Down Iecrease to 0	No change	50	Grass Increase Forb Decrease Shrub Decrease
Big Creek	No change	No change	Up Increase to 10,095 Static Decrease to 7,333 Down Decrease to 0	No change	50	Grass Increase Forb Decrease Shrub Decrease
Deseret	* * * * * * * * * * * * * * * * * * *		NO CHANGE	* * * * * * * * * * * * * * * * * *		Density No change Grass Decrease Forb Increase Shrub Increase
Dry Basin	No change	No change	Up Increase to 2,715 Static Decrease to 0	No change	60	Grass Increase Forb Decrease Shrub Decrease
Duck Creek	No change	No change	Up Increase to 12,864 Static Decrease to 313 Down Decrease to 0	No change	50	Grass Increase Forb Decrease Shrub Decrease
Eastman	* * * * * * * * * * * * * * * * * * *		NO CHANGE	* * * * * * * * * * * * * * * * * *		Density No change Grass No change Forb No change Shrub No change
East Woodruff	No change	No change	Up Increase to 2,167 Static Decrease to 0	No change	50	Grass Increase Forb Decrease Shrub Decrease
Kearl	No change	No change	Up Increase to 1,183 Static Decrease to 0	No change	50	Grass Increase Forb Decrease Shrub Decrease
Laketown	No change	No change	Up Increase to 2,524 Static Decrease to 0	No change	50	Grass Increase Forb Decrease Shrub Decrease
Meachum Canyon	No change	No change	Up Increase to 1,830 Static Decrease to 0	No change	50	Grass Increase Forb Decrease Shrub Decrease

(continued)

TABLE 3-7 (concluded)

Allotment	Livestock Forage Condition (Acres)		Apparent Trend (Acres)	Desirable Plant Vigor	Percent Livestock Utilization of Key Species	Composition and Density
	Cattle	Sheep				
Middle Ridge	* DISPOSAL *					
New Canyon	No change	No change	Up Increase to 7,484 Static Increase to 21,170 Down Decrease to 0	No change	50	Grass Increase Forb Decrease Shrub Decrease
Rabbit Creek	No change	No change	Up Increase to 3,191 Static Decrease to 0	No change	50	Grass Increase Forb Decrease Shrub Decrease
Sage Creek	No change	No change	Up Increase to 9,056	No change	50	Grass Increase Forb Decrease Shrub Decrease
Session	* DISPOSAL *					
South Woodruff	* NO CHANGE * * * * * * * * * * * * * * * * * *					Density No change Grass No change Forb No change Shrub No change
Stuart	No change	No change	Up Increase to 132 Static Increase to 873 Down Decrease to 0	No change	50	* * NO CHANGE * *
Twin Peaks	No change	No change	Up Increase to 2,292 Static Decrease to 0	No change	50	Grass Increase Forb Decrease Shrub Decrease
Woodruff Pastures	No change	No change	Up Increase to 12,015 Static Decrease to 5,929 Down Decrease to 0	No change	No change	* * NO CHANGE * *

additional 10 to 20 percent. This would result in vegetation compositional changes to undesirable or less desirable competitive vegetation, especially on the newly treated areas and a reduction in forage production to pretreatment levels.

Livestock Forage Production

Analyzing the impacts to forage production brought out some definite problems in attempting to attain proposed forage production of 35,241 AUMs. Positive benefits would be realized by water developments in five allotments that would open up 2,124 acres of potentially suitable range with high quality forage, increasing forage production by 1,182 AUMs, and the grazing and resting treatment on the Meachum Canyon Allotment would increase the livestock forage production by 38 AUMs; however, the proposed vegetation treatments on 65,187 acres which could be expected to produce 11,913 AUMs, would only produce approximately 5,598 AUMs (a loss of 6,315 AUMs) due to the low moisture-holding capacity of the soils in the big sagebrush types.

The benefits from grazing and resting treatments, level of use adjustments, range readiness turn-on date, changes in season of use, and range development would not improve condition or forage production, except in the short term within 5 to 10 years after the seedings. The following factors would contribute to the decline in production after the seedings from 25,400 AUMs (table 3-6) to pretreatment levels of 22,350 AUMs.

1. There would be an overobligation of 3,772 AUMs on five allotments which have an initial allowable utilization rate in excess of 50 percent.

2. Lack of a 10 to 15-percent allocation of competitive forage to wildlife.

3. Additional forage produced by the successful seedings would eventually decline to pretreatment levels after 20 years because of an increased intensity of livestock use and lack of allocation of forage to wildlife.

4. Limitation of June 1 turn-on date regardless of range readiness indicator.

5. The tendency of shrubs, particularly big sagebrush, to reinvade seedings.

The fencing of riparian habitat on 8.5 miles of six streams (208 acres) would result in excellent riparian conditions within the exclosure. The remaining 27 miles of riparian habitat (823 acres) would not change (a summary of impacts can be found in table 3-8).

TABLE 3-8

Summary of Impacts to Vegetation from Initial and Long Term Management Actions

Causal Agent	Impacts
INITIAL ACTION	
1. Adjustment in livestock use and assignment of total available forage to livestock. No assignment of forage preferred by both deer and livestock to wildlife.	No change in livestock forage condition classes, trend, vigor or density. Production on competitive vegetation would decline by 5 to 10 percent. Composition would change from desirable species to less desirable, highly competitive species.
2. Fencing of 208 acres of riparian habitat on 8 miles of six streams.	Riparian habitat would improve to potential on these acres.
3. Disposal of Middle Ridge and Session Allotments.	Unknown.
LONG-TERM MANAGEMENT	
1. Lack of sufficient rest for new seedings to become established.	Seedings would yield 10 to 15 percent less forage than expected.
2. Deseret, Eastman, South Woodruff, and Woodruff Pastures Allotments would remain in the same management as the initial action.	Vegetation production would continue unchanged from initial action.

(continued)

TABLE 3-8 (concluded)

Causal Agent	Impacts
3. Utilization restriction of 50 percent on grass, 60 percent on browse.	Overobligation of 3,772 AUMs upon implementation of long-term management action on five allotments (table 3-7).
4. Vegetation treatments on 65,187 acres in 14 allotments. Assuming seedings are successful.	Forage condition, trend, vigor, and production would improve after establishment of seedings. Grass composition would increase, browse would decrease. Density would remain unchanged in all allotments once seedings were established. Unsuccessful seedings could result in a loss of between 6,315 and 11,913 AUMs.
5. Increased intensity of livestock use on the seedings in 14 allotments.	No significant change in livestock forage condition classes, vigor, or density. Livestock forage production would decline, to pretreatment levels and undesirable forage species would increase.
6. Management actions and water developments.	There would be an increase of 38 AUMs from management actions and 1,182 AUMs from water developments on potentially suitable acres.

Project Construction

Construction of the proposed projects would impact vegetation. It is estimated that 116 surface acres would be disturbed by the construction of fences, pipelines, wells, and troughs (Soils, Chapter 3). The impacts to vegetation would be intense on the 116 acres affected. It is likely that the vegetation would be completely removed on these acres during construction activities. However, the standard project design (Appendix 8) calls for revegetation of these areas after construction. It is estimated that the revegetation would be partially established within 5 years after construction; however, even under the best of circumstances, it appears there may be at least a 30-percent chance that the revegetation efforts would fail on the first attempt (see Soils, Chapter 3). These sites can be expected to revegetate naturally, dominated initially by annual "weedy" plants, forbs, and other less desirable forage species in the long term.

Conclusion

Generally, the proposed action would not measurably change the livestock forage condition, vigor, density, or production in the long-term The livestock forage condition rating would still be at pretreatment levels of good - 41, fair - 54, and poor - 5 percent, respectively and the objectives to improve the livestock and wildlife forage production would not be attained.

IMPACTS TO SURFACE WATER QUALITY

Introduction

Water quality problems are caused by: (1) overgrazing that results in soil erosion, increased runoff, and pollutant transport; (2) concentrated grazing activities in the streamside management zone; and (3) impacts associated with rangeland treatments (EPA Draft, 1978). The degree of water quality impact associated with any system would be closely related to soil erosion and sedimentation associated with vegetation density and the concentration of livestock in and near water bodies.

The direct impact to water quality from rangeland livestock grazing would be slight except in areas of livestock concentrations. The impact would usually be in the form of increased fecal coliform concentrations in the water. However, the level and season of use proposed is not significantly different from the existing situation and would not change coliform concentrations appreciably. Most of the grazing-related impacts to water quality would be secondary impacts caused by the reduction in vegetation, compaction of soils, and destruction of streambanks and riparian vegetation. These actions increase runoff and streambank sloughing, which cause increases in suspended sediment and total dissolved solids (TDS) concentrations.

Of the 19 allotments in the Randolph Planning Unit, only three (East Woodruff, Session, and Stuart) have no creeks or reservoirs in the allotment and do not drain into creeks or reservoirs on other allotments or into Bear Lake. Since management actions on these allotments would not affect water quality, no impact assessment has been done on them. Of the remaining 16 allotments, water quality impacts due to the initial action and long-term management are addressed below.

Data on the 100-year floodplain for the Bear River are not available in the ES area. However, no impacts from the proposed management actions are anticipated.

Initial Action

The three proposed management actions in the initial action which would have an impact on water quality are: (1) range readiness livestock turn-on; (2) change in intensity of use, and (3) fencing of riparian habitat to exclude livestock grazing. The range readiness turn-on date would have both positive and negative impacts to soils and vegetation as described earlier in the soils and vegetation sections of this chapter. These changes from the existing situation would be small and water quality impacts would not be measurable.

Changing the intensity of grazing can have a positive or negative impact on water quality. An increase or decrease in grazing intensity would cause a reduction or improvement, respectively, in root growth, plant vigor, and infiltration rate, thereby lowering or increasing, respectively, resistance to erosion, and runoff (Vegetation Chapter 3). These changes in intensity are anticipated to cause an upgrading of erosion class (Chapter 3 Soils) in one allotment (Big Creek), thus decreasing the erosion and improving water quality. Increased levels of grazing in Meachum Canyon, Laketown, Sage Creek, and Twin Peaks Allotments would cause increased streambank use in riparian areas, with increasing stream sedimentation and decreasing water quality in Home Creek, Laketown Creek, Sage Creek, and North Fork Sage Creek. Decreased levels of grazing on three allotments would increase riparian habitat condition and improve water quality on six streams (table 3-9).

Long-Term Impacts

The implementation of the proposed grazing/resting treatments and range management facilities (fences, water, etc.) would not have a measurable effect on water quality. Water projects should alleviate the congregation of livestock around streams, but the reduced streambank sloughing would not be measurable and, therefore, neither would the water quality impact. Since streambanks not fenced for riparian management would receive periodic rest from livestock use during deferred rotation, some improvement in water quality would occur during these rest periods.

Limiting utilization to 50 percent on grasses and 60 percent on browse would decrease utilization on Big Creek, Duck Creek, New Canyon, Sage Creek Allotments, and the Dry Basin Pasture of Woodruff Pastures Allotment would have less utilization due to rest and interseeding (see Vegetation). This would be accompanied by noticeable decreased erosion on Big Creek and Duck Creek Allotments (Soils Chapter 3). Nine allotments (Bear Lake, Dry Basin, East Woodruff, Kearl, Laketown, Meachum Canyon, Rabbit Creek, Stuart, and Twin Peaks) may increase utilization depending on the availability of forage species (see Vegetation). Of

TABLE 3-9

Summary of Impacts on Water Quality

Resource Category	Area Affected	Probable Impacts	Relationship to Proposed Management Action
INITIAL ACTION			
Water Quality	Home Creek, Sage Creek, North Fork Sage Creek, and Laketown Creek.	Decreased water quality from increased streambank sloughing and sedimentation.	Increased grazing intensity on Laketown, Meachum Canyon, Sage Creek, and Twin Peaks Allotment.
	1.75 miles of Randolph Creek, 2.25 miles of Laketown Canyon Creek, 0.75 mile of Middle Fork Otter Creek, 2.25 miles of North Fork Otter Creek, 0.25 mile of Spring Creek, 0.75 mile of Little Creek.	Increased streambank stabilization would decrease sloughing and greatly improve water quality.	Fence riparian areas to increase streambank cover, stabilize streambank against sloughing and improve water quality.
	Randolph Creek, Big Creek, South Fork Six-Mile Creek, Six-Mile Creek, Home Creek.	Increased water quality from decreased streambank sloughing and sedimentation.	Decreased level of grazing intensity on Big Creek, Duck Creek, South Woodruff, and Woodruff Pastures Allotments.
LONG-TERM MANAGEMENT			
Water Quality	Randolph Creek, Big Creek, Old Canyon Creek, Six-mile Reservoir, North Fork Six-mile Creek, South Fork Six-mile Creek, North Fork Sage Creek, South Fork Sage Creek, North Fork Otter Creek, Middle Fork Otter Creek, South Fork Otter Creek, New Canyon Creek, Spring Creek, Little Creek, Little Creek Reservoir.	Increased runoff on 5,072 acres from burned areas because of loss of litter and cover. If seedings fail, increased runoff becomes a serious threat. Increased sediment loads in streams. These would all be short-term impacts (less than 3 years).	Vegetation manipulation in Big Creek, Duck Creek, New Canyon, Sage Creek, and Woodruff Pastures Allotments.
	Big Creek, and Duck Creek Allotments.	Increased water quality from less erosion in Big Creek and Duck Creek Allotments. Decreased water quality from increased erosion in Meachum Canyon Allotment.	Limit utilization to 50 percent on grasses and 60 percent on browse.
		Continued degradation on 27 miles of stream.	Adjustment in grazing intensity on streams in fair and poor condition.
	Same as under initial action.	Same as under initial action.	Continued fencing of riparian areas.

those allotments that would support an increase in utilization, Meachum Canyon would show a corresponding increase in erosion and decrease in water quality (Soils Chapter 3).

The initiation of long-term management actions would cause definite impacts from vegetation manipulations and conversions. Following fire treatment of vegetation and before seedling stabilization, the area would be susceptible to increased runoff from rains (Soils Chapter 3). This impact would be realized on 14 streams and one reservoir (table 3-9). Chemical treatment would add a threat of pollution of the water, which has not occurred in the area before. This threat would be minimized by the use of 2,4-Dichlorophenoxyacetic acid (2,4-D). With the half life of 2,4-D being only a few days and a 0.5-mile buffer around water bodies, the risk of water pollution from runoff is minimized. The risk to the private grasslands is also minimal since 2,4-D is relatively harmless to grasses. Studies of water samples in the eastern United States from unprotected streams which were directly sprayed with 2,4-D show concentrations of the chemicals below the levels recommended for public water supplies by the Environmental Protection Agency, and much below the 50-percent lethal dose values for fish (Vegetation Management with Herbicides in the Eastern Region, Final ES, USDA, Forest Service, 1978). Compliance with design specifications (Appendix 8) would minimize or eliminate adverse impacts.

If establishment of the newly seeded plants does not occur and reseeding is necessary, the treated area would be exposed to rain and unprotected from increased sediment flow. This would cause degradation of the water quality of the nearby streams. A 13-percent sampling of the total acres proposed for vegetation treatments showed that there is a 46.8-percent chance of seeding success. The establishment of the seeding would increase the species of plants desired for livestock or wildlife grazing.

Streams fenced for protection of riparian habitat in the initial management action would continue to improve through the long-term management action. This would have a continued beneficial impact on water quality as noted in the Initial Action section.

Conclusion

There would be a decrease in water quality on four streams in four allotments due to increased grazing intensity in the initial action. Water quality would improve on parts of six streams (8 miles) due to fencing of riparian areas. There would also be an increase in water quality on five streams in four allotments due to a reduction in grazing intensity in the initial action (table 3-9). The long-term management actions would reduce water quality due to increased runoff from the loss of litter and cover from burning 5,072 acres of vegetation. This would reduce water quality on 14 streams and one reservoir in seven allotments (table 3-9). The 7 acres proposed for burning in the Laketown Allotment would not have a noticeable impact on water qualty. Chemical pollution of surface waters by spraying 2,4-D is not expected to be significant because of the limited number of days on which spraying would occur, the relatively brief halflife of 2,4-D (a few days) and the 0.5-mile buffer zone around streams, springs, and reservoirs. Limiting utilization to 50 percent on grasses and 60 percent on browse would improve water quality on Big Creek and Duck Creek Allotments, and degrade water quality in Meachum Canyon Allotment because of decreases and increases in livestock use, respectively. Riparian areas fenced in the initial action would continue to improve under the long-term management while 27 miles of unfenced streams would continue to decline in water quality.

Of the 19 allotments in the Randolph Planning Unit, only the Bear Lake, Duck Creek, New Canyon, and Dry Basin Pasture portion of Woodruff Pastures Allotments are expected to achieve the management goal of improved water quality. Meachum Canyon Allotment is not expected to reach the goal. Whether the remaining allotments would achieve an increased water quality in the long term is unknown for reasons described above. Naturally, all riparian fencing projects would aid in the accomplishment of the management goal. Table 3-9 summarizes impacts on water quality from the initial action and long-term management.

IMPACTS TO WILDLIFE

Introduction

The cumulative impacts to wildlife that would result from the proposed initial action and long-term management are discussed in this section. The analyses of wildlife impacts by allotments are found in Appendixes 17 and 18. Any changes in wildlife populations would be related to recreation and land use, and wildlife related impacts to the human environment are discussed in those sections.

Some impacts presented in this section are not readily quantifiable by units since population levels and specific habits are not known. In order to give the reader a sense of the magnitude of impacts upon wildlife, the following system is used to qualify the impacts:

Minor

The impacts would not alter the wildlife species' habitat enough to change the species' current vigor or population size.

Moderate

Impacts would alter the habitat sufficiently to place stress upon the wildlife species in order to maintain current vigor and productivity; or vigor and populations could begin to increase.

Major

Impacts would alter habitat beyond the point where the wildlife species could compensate for the change and vigor and population size would decline; or vigor and population size would increase.

Severe

Impacts would produce long-term reduction of population size, vigor, and degradation of the habitat.

Initial Action Impacts

Deer

The condition of deer habitat on 5,953 acres of critical deer winter range in seven allotments would continue to decline (table 3-10) because of the overutilization of preferred deer forage species by livestock. Even though the stocking rate would be reduced on 4,890

TABLE 3-10

Deer Habitat Condition - Initial Action

Allotment	Acres	Present Percent Utilization	Habitat Condition Class	Proposed Percent Utilization	Expected Change	Predicted Condition Class
CRITICAL DEER WINTER RANGE						
Bear Lake	1,050	59	Good	55	Decline	Good
Big Creek	1,014	65	Poor	54	Decline	Poor
Deseret	250	23	Poor	29	Decline	Poor
Eastman	550	55	Poor	53	Decline	Poor
Laketown	894	45	Good	48	Decline	Good
Meachum Canyon	243	14	Poor	21	Decline	Poor
South Woodruff	1,952	74	Poor	63	Decline	Poor
Stuart	930	55	Poor	32	Improve	Poor
Woodruff Pastures	9,917	60	Very poor	50	Improve	Poor
SEASONAL DEER RANGES						
Dry Basin	2,781	26	Fair	28	Decline	Fair
Duck Creek	13,410	66	Fair	60	Decline	Fair
East Woodruff	2,167	19	Fair	19	No change	Fair
Kearl	1,183	54	Fair	19	Improve	Good
Middle Ridge	1,286	12	Fair	24	Decline	Fair
New Canyon	30,665	59	Fair	59	No change	Fair
Rabbit Creek	3,257	37	Fair	37	No change	Fair
Sage Creek	10,153	51	Fair	52	Decline	Fair
Session	238	50	Fair	50	No change	Fair
Twin Peaks	2,292	30	Fair	38	Decline	Fair

acres, utilization of preferred deer forage species by livestock would continue at a level above 50 percent allowable use. Two allotments (493 acres) with increases in utilization would decline and there would be minor improvement in habitat on two allotments (10,847 acres).

One allotment with seasonal deer range would continue to decline because of overutilization of preferred deer forage species even though the stocking rate was reduced. There would still be utilization of key forage species by livestock in excess of the 50 percent allowable use. Four allotments (16,511 acres) which had increases of livestock grazing intensity would decline in condition. Four allotments would have no change and one allotment would improve (table 3-10).

Sage Grouse

The condition of the sage grouse habitat in three allotments (seven complexes) would decline because of continued overutilization of preferred sage grouse forage species by livestock (table 3-11). Even though there would be a reduction in livestock numbers, the livestock utilization would still exceed 50 percent. Three allotments (seven complexes) would decline because of increases in livestock utilization over present utilization and two allotments (three complexes) would not change. The remaining 11 allotments do not have known sage grouse habitat.

Nongame

Impacts on nongame birds and mammals from implementation of the initial action would be minor. Species composition of nongame birds and mammals would respond to the change in vegetation with a shift to greater species diversity.

No adverse impacts to endangered species are anticipated as a result of the proposed initial action.

The proposed initial action would not meet the following wildlife objectives: maintain or improve condition of critical deer winter range, maintain existing deer forage production (8,435 AUMs), and maintain or improve sage grouse habitat condition.

TABLE 3-11

Impacts to Sage Grouse Habitat - Initial Action

Allotment	Present Utilization (Percent)	Present Condition Class	Proposed Utili-zation	Expected Change in Condition	Predicted Condition Class
DISPOSAL					
Middle Ridge	12	....	...	....	....
Session	50	....	...	....	....
CONTINUE INITIAL ACTION MANAGEMENT					
Deseret	23	Poor	29	Decline	Poor
Eastman	55	....	...	....	....
South Woodruff	74	Fair	63	Decline	Poor
IMPROVED MANAGEMENT					
Bear Lake	59	....	...	....	....
Big Creek	65	Poor	54	Decline	Poor
Dry Basin	26	Fair	28	Decline	Fair
Duck Creek	66	Fair	60	Decline	Fair
East Woodruff	19	Poor	19	No change	Poor
Kearl	54	....	...	....	....
Laketown	45	....	...	....	....
Meachum Canyon	14	....	...	....	....
New Canyon	59	Poor	59	No change	Poor
Rabbit Creek	37	....	...	....	....
Sage Creek	51	Fair	52	Decline	Fair
Stuart	55	....	...	....	....
Twin Peaks	30	....	...	....	....
Woodruff Pastures	60	....	...	....	....

Long-Term Management

Deer

Three allotments (Deseret, Eastman, and South Woodruff) would continue under the initial action proposal. Therefore, the deer winter range habitat condition would continue to decline as shown in table 3-10.

Two allotments, Middle Ridge and Session, would have been disposed of before the long-term management was implemented, therefore, no impacts have been analyzed in the long term for these allotments. Only the remaining 14 allotments will be analyzed further.

In the spring and summer months, deer consume large amounts of young forbs and grasses. These contain the very essential nutrients needed to restore the deer to a healthy state following the stresses of winter malnutrition (BLM Tech. Supp. 6601-6). Julander et al., (1961) reported that deer forced to live on poor condition summer ranges (i.e., low densities of preferred forbs) had body weights of only 60 percent that of deer on good condition summer ranges. Herd productivity was similarly low. Further, deer entering winter in less than vigorous health have a higher winter mortality rate (Robinette et al., 1952). In order to maintain healthy and productive deer herds, deer must have plentiful amounts of preferred forage available on seasonal spring and summer ranges (Julander et al., 1961).

Deer summer range on BLM-administered land is generally in fair condition. Where forage quality is low, successful proposed range seedings would provide long-term improvements in the quality and quantity of deer forage by providing more preferred forb and browse species. But, spraying or burning treatments on deer ranges would produce immediate deer forage shortages from localized removal of the deer forage. Burning treatments would remove all cover and forage. Spraying treatments may kill most forage and cover. These shortages may last from 3 to 5 years until seedings mature. Because deer keep to definite home ranges and may not migrate from these treated areas; malnutrition or starvation could occur (BLM Manual Tech. Suppl. 6601-6). The severity of this impact would be directly proportional to the size and shape of treated areas and the percentage of cover and forage removed by the treatment. Deer will not use areas far from protective cover and the large block areas proposed for treatment would not be used by the deer. However, small treated areas interspersed with untreated vegetation would be used by the deer as soon as the forage became available (BLM Tech. Suppl. Manual 6601-6). Studies have shown that deer exposed to the 2,4-D herbicide, which would be used for the vegetation treatments, did not accumulate harmful amounts of the herbicide. Therefore, no harmful impacts would be expected (Vegetation Management with Herbicides in the Eastern Region, Final ES, USDA Forest Service, 1978).

Proposed long-term management would permit (during 2 consecutive years out of 6) livestock consumption of all allowable use of forage on 11,174 acres of poor condition critical deer winter range as follows:

Big Creek	1,014 acres
Meachum Canyon	243 acres
Woodruff Pastures	9,917 acres
	11,174 acres

This would leave no allowable use for deer on preferred deer forage on these acres during the critical winter period of January 1 through March 15. Therefore, the heavy deer use on preferred browse during this period would result in major overgrazing. Deer would then be forced to consume low quality forage and their health would decline. The grazing schedule could intensify these impacts (i.e., overgrazing and malnutrition) by allowing livestock to remove essential deer forage on large acreages of critical deer winter range in the same years. Impacts from loss of this forage would be compounded because winter conditions prevent deer from using other ranges.

Impacts to critical deer winter range within the Woodruff Pastures Allotment would be serious since this allotment has 58 percent (9,917 acres) of all critical deer winter range on BLM-administered land within the planning unit. Further, this critical deer winter range is in very poor condition from lack of preferred browse and cover.

Analysis of the proposed grazing treatment in Woodruff Pastures Allotment by the vegetation section predicts a decline of browse and cover on 50 percent (4,919 acres) of the allotment's critical deer winter range. Proposed treatments could remove all desirable (as well as undesirable) forage species on all 9,917 acres of critical deer winter range. Chapter 3 Soils and Vegetation sections predict only a 46.8-percent success probability for seedings in Woodruff Pastures. After accounting for dietary overlap, the planned seedings in Woodruff Pastures would provide 98 additional AUMs to wildlife (table 3-12). Currently, the deer AUM demand in Woodruff Pastures exceeds available wildlife forage by 78 AUMs. Future deer AUM demand in this allotment would exceed BLM forage allocations to wildlife by 1,384 AUMs (table 3-12).

Following the treatment schedule for Woodruff Pastures, the sprayings and/or burnings scheduled for this allotment could remove all deer winter forage within this allotment before any new forage from the treatments becomes usable. New shrub growth or regrowth from existing shrubs would not be substantial enough for any deer use for at least 3 years until the seedings become established (Vegetation, Chapter 3). Snow depth on critical deer winter range could hold the new forage unavailable for even longer than 3 years. The deer herds would be forced into heavier concentrations on other critical deer winter ranges and private lands. This would increase the use on remaining deer forage. Localized depletion of the deer ranges and starvation would occur.

The proposed grazing treatments would produce moderate benefits to the deer herds by removing livestock from the critical deer winter ranges during 4 out of 6 years. This would eliminate all forage and spatial competition between the two species during the rest from livestock grazing. The schedule of the rest treatments would determine the extent of this impact during a given year.

Under current conditions, only one allotment, Woodruff Pastures, has a forage shortage. In this allotment, past vegetation treatments and overgrazing have removed preferred deer forage species. Under

TABLE 3-12

Existing and Projected Future AUMs Available for Deer

Allotment	Seasonal AUMs					Critical Winter AUMs				
	Existing	Additional[a] With Treatments	Total	Demand	Shortfall	Existing	Additional[a] With Treatments	Total	Demand	Shortfall
DISPOSAL										
Middle Ridge	59	.....	.....	[b]251	251	.....	.....	.....	.....	.....
Session	14	.....	.....	[b]40	40	.....	.....	.....	.....	.....
CONTINUE INITIAL ACTION MANAGEMENT										
Deseret	.....	.....	.....	.....	.....	738	13	751	68	.....
Eastman	156	102	258	330	72	68	.....	68	150	82
South Woodruff	190	29	171	414	243	297	111	408	646	238
IMPROVED MANAGEMENT										
Bear Lake	.....	.....	.....	.....	.....	184	.....	184	217	33
Big Creek	969	641	1,610	1,646	36	125	47	172	227	55
Dry Basin	134	203	337	564	227	.....	.....	.....	.....	.....
Duck Creek	522	35	537	678	141	.....	.....	.....	.....	.....
East Woodruff	125	47	172	518	346	.....	.....	.....	.....	.....
Kearl	55	.....	55	235	180	.....	.....	.....	.....	.....
Laketown	112	.....	112	188	76	117	1	118	184	66
Meachum Canyon	87	45	132	186	54	30	7	37	67	30
New Canyon	1,556	908	2,464	2,622	158	.....	.....	.....	.....	.....
Rabbit Creek	156	46	202	395	193	.....	.....	.....	.....	.....
Sage Creek	388	259	647	1,254	607	.....	.....	.....	.....	.....
Stuart	.....	.....	.....	.....	.....	115	73	188	255	67
Twin Peaks	87	.....	87	461	374	.....	.....	.....	.....	.....
Woodruff Pastures	929	258	1,187	1,286	99	1,222	98	1,320	2,704	1,384
TOTALS	5,539	2,515	7,971	11,068	3,097	2,896	350	3,246	4,518	1,955

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[a] Treatment AUMs reflect a correction for seeding failure and an additional 40 percent reduction for dietary overlap between livestock and deer.

[b] Disposed AUMs, but deer demand still exists.

proposed long-term conditions, forage shortages would occur on 4,939 additional acres of fair and poor condition ranges from the method used to allocate deer forage (table 3-12). During the allocation process (Vegetation Chapter 3 and Appendix 6), deer rarely received forage allocations from their preferred species, but were assigned forage based largely upon those less desirable species such as big sagebrush (Artemesia tridentata) and rabbitbrush (Chrysothamus nauseosus). Deer, however, cannot live on these species, as they require a wide variety of browse and forbs (BLM Man. Tech. Supp. 6601-6). The deer would use only minor amounts of the sagebrush and would consume forage allocated to livestock. Overgrazing would occur on forage preferred by deer, sheep, and cattle. A proportional decline of deer forage would occur followed by directly proportional losses in deer numbers within the planning unit (Robinette, Julander et al., 1952).

These impacts would be compounded because the livestock would be allowed to graze the fall and critical deer winter ranges before arrival of the deer. Critical deer winter range on Meachum Canyon and Deseret Allotments would receive even more grazing pressure from major increases (32 percent and 21 percent, respectively) in livestock grazing levels (Appendix 4).

These impacts would result in nonattainment of the long-term objective of increasing deer forage production by 8,819 AUMs. Without this expected increase of available forage, it is doubtful that deer numbers would increase to the desired projected numbers.

Conclusion of Impacts to Deer

Vegetation treatments would provide wildlife with an additional 2,865 good quality AUMs after the seedings mature. However, the treatments would produce major deer forage shortages for 3 to 5 years on 65,187 acres. During this period, deer would overuse the untreated acres and malnutrition and starvation could occur. Failure to provide the present deer herds with sufficient quality forage and the additional AUMs necessary to feed the projected deer herd increases would produce malnutrition and starvation. The deer herds would not increase to desired levels and could decrease in size.

Sage Grouse

During the long-term management, two sage grouse complexes in fair condition (South Woodruff) would decline to poor condition because of reduced forb composition; habitat condition ratings on all other complexes would remain unchanged (table 3-11). Vegetation treatments (sprayings and burnings) in seven allotments (14 sage grouse areas) would remove most cover and sage grouse forage immediately upon treatment. Project design specifications would protect known sage grouse strutting complexes and approximately 15 percent of the nesting habitat adjacent to these sites. Treatments outside the protected areas would cause displacement or abandonment of these areas until vegetation returned to pretreatment conditions (Walstad, 1975; Higby, 1969). Vegetation treatments which disturb nesting areas would produce severe negative impacts to the sage grouse populations. Braun et al. (1977) reports that sage grouse are incapable of adjusting their life processes to compensate for sagebrush treatments on their seasonal ranges. In Utah, Enyeart (1956) found that sagebrush treatments around nesting areas caused the sage grouse to abandon the areas. Spraying treatments would leave moderate amounts of dead standing cover, but they would produce major to severe long-range reductions of sage grouse forage (forbs and sagebrush). The fall burning treaments would remove more sagebrush cover and forage than spraying treatments. Both treatment types would destroy sage grouse habitat and those grouse unable to find other suitable habitat would die.

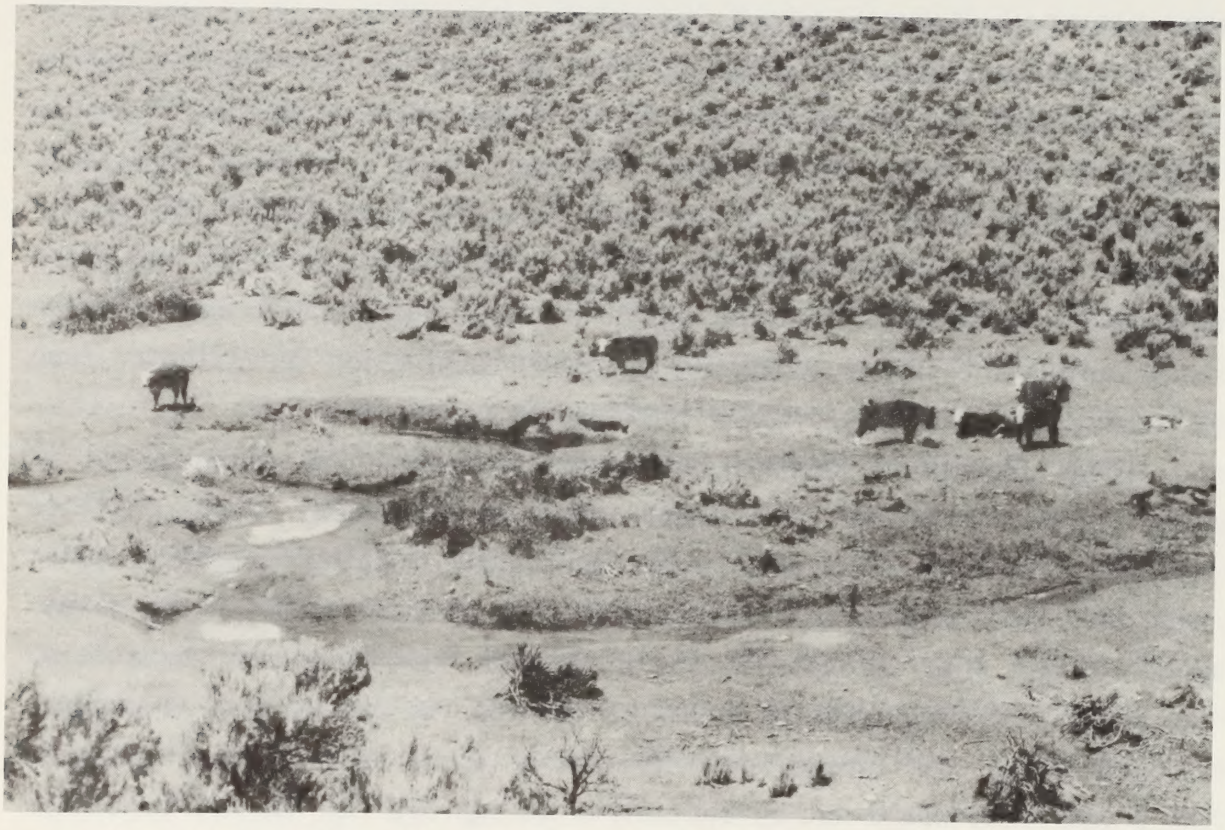
Vegetation treatments in the planning unit would cause major displacement or removal of seven known sage grouse populations. No harmful effects to sage grouse would be expected from the 2,4-D herbicide (Vegetation Management with Herbicides in the Eastern Region, Final ES, USDA Forest Service, 1978).

Heavy livestock concentrations during the summer months would degrade meadow and riparian areas upon which young sage grouse are highly dependent (Walstad, 1975, June, 1963). After the sage grouse clutches hatch, hens move their chicks to nearby meadow and riparian areas (Walstad, 1975; Savage, 1969). Young grouse feed almost entirely on insects for the first 4 weeks, then gradually change their dietary preference to succulent forbs (BLM Manual 6601-3, Braun et.al., 1977). The meadow sites provide essential habitat for both insect and forb production. Proposed vegetation treatments located in dry meadow areas would offset sage grouse diets and subsequent chick production. Studies by Savage (1969) indicate that young sage grouse diets consisted almost entirely of species restricted to meadow areas.

Livestock allowed to graze in these areas (fig. 3-2) would continue to concentrate in and overgraze these meadow sites, reducing the food available for young sage grouse (Hormay, 1976). Studies show that reductions in stocking rates do not reduce cattle concentrations or overuse in these areas (Hormay, 1976). Therefore, proposed long-term management actions which allow cattle to overgraze meadow and riparian areas during the summer months would result in a major reduction of food for young sage grouse and would limit their production.

These impacts of competition from livestock would occur in all 17 sage grouse complexes. This would continue yearly in seven complexes located within two allotments under continuous grazing management (Deseret and South Woodruff). On the remaining 10 complexes (in six allotments) under grazing systems, these impacts from livestock competition would occur during 4 out of 6 years. During the 2-year rest from livestock grazing, all forage would be available for sage grouse. However, the 2-year rest would not be sufficient to improve the habitat condition ratings (Vegetation, Chapter 3; Duff, 1977).

Sage grouse wintering areas are either flats or gentle slopes having greater than 25 percent sagebrush cover at least 12 inches in height available above the snow level (BLM Manual Tech. Supp. 6601-3). Currently, the locations of these areas are not known. However, it is assumed that these areas would receive range treatments to remove the sagebrush. The result would be a severe winter kill of the sage grouse utilizing these wintering areas.



CATTLE CONCENTRATIONS IN SAGE GROUSE BROOD REARING (MEADOW)

FIGURE 3– 2

WILDLIFE

Conclusion of Impacts to Sage Grouse

Vegetation treatments would cause major reductions or removal of seven known sage grouse populations. Livestock overutilization of meadow and riparian areas essential for sage grouse production could produce a decline of all 17 known sage grouse populations.

Nongame

Proposed protection from grazing of 8 miles (208 acres) of riparian habitat in poor condition would provide cover and food improvement for birds, reptiles, small mammals, and amphibians. Duff (1977) and Fisheries Chapter 3 state that in riparian habitat stream areas protected from grazing, the vegetation diversity and vigor would improve from poor to excellent condition if no livestock trespass occurs. Wildlife population, size, and diversity would be expected to improve similarly.

The remaining 27 miles (823 acres or 76 percent of the riparian habitat) left unprotected from grazing would continue to decline (Fisheries Chapter 3), reducing cover and food for wildlife.

Impacts to nongame birds and mammals from proposed long-term management are also related to predicted changes on other vegetation types.

The type of impacts would depend on the size of the treatment area, pattern of the treatment, successional stage of the surrounding untreated areas, and whether the treatment would result in any specialized habitat conditions for certain nongame species (Buttrey and Shields, 1975). Initially, conversion from one vegetation type to another would result in displacement and loss of habitat components such as nesting and hiding cover or food that is required for survival by some species.

Prescribed burning and herbicide treatments could result in major conversion of existing shrub types. Loe and White (1974) emphasized that the impacts to nongame birds and mammals associated with conversion projects would generally be positive if the treated areas are well planned, relatively small, broken up with untreated areas, and reseeded with additional herbaceous species.

Conclusion

Vegetation treatments would decrease the diversity and population sizes of nongame bird and small mammal populations on 65,187 acres. Fencing 208 acres of riparian habitat would increase diversity and populations of wildlife using thse areas.

Antelope

The proposed 372 AUMs of antelope forage would be allocated from competitive wildlife AUMs. However, only 140 AUMs from the Deseret Allotment would be available, as all other allotments would have wildlife AUM allocation shortages. Therefore, the forage would not be available to permit introduction of antelope.

Threatened and Endangered Species

No known adverse impacts to endangered species are anticipated as a result of implementation of the proposed long-term management.

IMPACTS TO FISHERIES HABITAT

Introduction

Livestock grazing of aquatic/riparian and fisheries habitat removes or eliminates riparian streambank vegetation and causes physical trampling of the streambanks. These actions reduce or eliminate key resource parameters which are the limiting factors to productive and self-sustaining aquatic/riparian and fisheries habitat, i.e., streambank vegetation, cover, streambank soil stability, and pool and water quality (less depth, cover, velocity, and oxygen, higher temperatures, and increased sedimentation). Depending upon the condition of the key resource parameters (URA Step 3 Fisheries), a rating of poor, fair, good, or excellent was assigned to the streams. Poor condition is one of shallow pools, low stream depth, lack of streambank cover, bank instability, high siltation, and few or no fish present. Fair condition is one of deeper pools, some streambank cover but with exposed areas, siltation improved over poor condition, increased fish numbers over poor condition. Good condition is high streambank grasses, deeper pools, greater fish numbers, still some sedimentation exists. There are no streams in the ES area rated excellent (Appendix 12).

Generally, riparian vegetation begins growth earlier in the spring and continues growth later into the fall than most upland range plants. During this time, the plants are more palatable than dried range plants and are actively sought by cattle (Platts and Rountree, 1972). Because of this, vegetation in meadows and along streams is invariably closely utilized under any stocking rate or system of grazing. Removal of more than 60 percent of crown can significantly reduce the regrowth potential of some species (Hormay, 1970).

Two studies conducted by Platts and Rountree (1972) and Eckert (1975) question whether riparian vegetation can be restored on previously overgrazed pastures through the use of rotation grazing management systems. These authors concluded that riparian vegetation receiving 1 year of rest in a rotation system did not recover adequately. Thus, according to their findings, in some cases pastures may increase in forage during a yearlong rest, but riparian vegetation and streambanks do not recover.

This type of grazing prevents the natural replacement of woody riparian species, i.e., old cottonwoods by younger trees in riparian zones. Such use is detrimental to wildlife numbers and species diversity, aesthetic, recreational, or other values. About the only way to preserve such values is to fence off the area from grazing. Reducing livestock or adjusting the grazing season will not solve such a problem (Hormay, 1976).

Initial Action

Two hundred eight acres of the total riparian habitat (1,031 acres) would be protected from grazing. A total of 8.5 miles of stream would be included in this protective fencing (0.5-mile existing Big Creek exclosure, 2.2 miles Laketown Creek, 2.25 miles North Fork Otter Creek, 0.75 mile Middle Fork Otter Creek, 0.25 mile Spring Creek, 0.75 mile

Little Creek and 1.75 miles Randolph Creek.) This amounts to protection of 24 percent of the area's 35.5 miles of stream habitat. The present condition of aquatic/riparian and fisheries habitat, and predicted conditions as a result of the initial and long-term management actions, are shown in table 3-13. In grazed areas, these impacts would create "no change" conditions over the existing situation since they would continue to reduce/eliminate key resource parameters. Specific impacts to these resource parameters are shown by allotment in Appendix 19.

Although livestock numbers would be reduced, seasons changed, and rest provided in most cases, these reductions and changes would not be significant enough in numbers and time to allow recovery of the remaining 76 percent of the existing degraded resource (poor declining condition). The rest periods proposed under the grazing and resting treatments would not allow for the recovery of riparian resources nor streambank stability conditions necessary to allow for a vigorous and productive habitat for fisheries survival and maintenance. While protective fencing would improve vegetation and streambank conditions, the aquatic habitat would not improve correspondingly due to sedimentation and water quality deterioration inflow from upstream grazing impacts in the riparian zone (Duff 1978). In two fenced stream areas where headwater sources would be included, habitat and fisheries would be significantly improved. The BLM Big Creek Stream Improvement Demonstration Area has shown the recovery and use potential for area streams based on 8 years of study. It shows that stream riparian zones would continue to be impacted from grazing unless specific riparian protection is provided. Studies on Big Creek have shown that after 4 years of rest and recovery inside an exclosure, good stream habitat conditions were set back 4 years to previous poor conditions when trespass livestock were allowed inside the exclosure for only a 6-week period in the spring (Duff, 1976). The proposal does not fulfill the objective to protect and maintain aquatic/riparian habitats since grazing treatments are designed specifically to improve range plant (terrestrial, dryland) species condition and not the wetland-riparian woody vegetative species. The

TABLE 3-13

Aquatic/Riparian and Fisheries Habitat - Present and Predicted Future Conditions

Allotment	Habitat Acres		Stream	Total Miles	CONDITION					
					Present		Initial Action		Long Term	
	Aquatic[a]	Riparian[b]			Miles		Miles		Miles	
Rabbit Creek	0.3	33	North Fork Six-mile	0.25	0.25	Poor	0.25	Poor	0.25	Poor
Duck Creek	1.1	175	South Fork Six-mile	3.25	3.25	Poor	3.25	Poor	3.25	Poor
			North Fork Sage (upper reach)	0.75	0.75	Poor	0.75	Poor	0.75	Poor
Sage Creek	1.0	83	North Fork Sage (lower reach)	1.25	1.25	Poor	1.25	Poor	1.25	Poor
			Sage Creek	2.0	0.5	Fair	0.5	Fair	0.5	Fair
					1.5	Poor	1.5	Poor	1.5	Poor
Laketown	3.8	93	Laketown (lower reach)	4.0	0.5	Fair	1.0	Good	1.0	Good[c]
					3.5	Poor	3.0	Poor	3.0	Poor
Twin Peaks	1.4	35	Laketown (upper reach)	1.5	0.5	Fair	1.2	Good	1.2	Good[c]
					1.0	Poor	0.3	Poor	0.3	Poor
New Canyon	6.5	357	North Fork Otter Creek	5.0	3.0	Fair	2.25	Good	2.25	Excellent
					2.0	Poor	0.75	Fair	0.75	Fair
							2.0	Poor	2.0	Poor
			Middle Fork Otter Creek	1.75	1.75	Poor	0.75	Good	0.75	Excellent
							1.0	Poor	1.0	Poor
			South Fork Otter Creek	0.75	0.75	Poor	0.75	Poor	0.75	Poor
			New Canyon Creek	1.0	1.0	Poor	1.0	Poor	1.0	Poor
			Spring Creek	0.5	0.5	Poor	0.25	Good	0.25	Good[c]
							0.25	Poor	0.25	Poor
			Little Creek	1.25	1.25	Poor	0.75	Good	0.75	Good[c]
							0.5	Poor	0.5	Poor
			Old Canyon Creek	1.75	0.75	Fair	0.75	Fair	0.75	Fair
					1.0	Poor	1.0	Poor	1.0	Poor
Big Creek	9.1	151	Randolph Creek	3.0	1.25	Fair	1.75	Good	1.75	Good[c]
					1.75	Poor	1.25	Poor	1.25	Poor
			Big Creek (exclosure)	0.5	0.5	Good	0.5	Good	0.5	Good[c]
			Big Creek (outside exclosure)	2.5	0.5	Fair	0.5	Fair	0.5	Fair
					2.0	Poor	2.0	Poor	2.0	Poor

[a] Aquatic habitat is the wetted portion of the stream.

[b] Riparian habitat is the wetland streambottom vegetative habitat next to the stream.

[c] Aquatic habitat conditions for sensitive cutthroat trout would improve to good but not excellent due to continued upstream livestock use. Riparian vegetation would probably improve to excellent condition, however.

(continued)

TABLE 3-13 (concluded)

Allotment	Habitat Acres		Stream	Total Miles	CONDITION					
	Aquatic[a]	Riparian[b]			Present		Initial Action		Long Term	
					Miles		Miles		Miles	
Woodruff Pastures	1.6	18	Birch Creek	0.75	0.25	Fair	0.25	Fair	0.25	Fair
					0.5	Poor	0.5	Poor	0.5	Poor
Middle Ridge	1.7	38	Walton Creek	1.5	0.5	Fair	0.5	Fair	0.5	Fair
					1.0	Poor	1.0	Poor	1.0	Poor
			Woodruff Creek	0.25	0.25	Fair	0.25	Fair	0.25	Fair
South Woodruff-Meachum Canyon	0.9	48	Home A[d] (natural channel)	1.0	1.0	Poor	1.0	Poor	1.0	Poor
			Home B[d] (old ditch channel)	1.0	1.0	Poor	1.0	Poor	1.0	Poor
TOTAL	27.4	1,031		35.5	0.5	Good	8.5	Good	3.5	Excellent
					8.0	Fair	3.5	Fair	5.5	Good
					27.0	Poor	23.5	Poor	3.5	Fair
									23.5	Poor

Source: Wiche, 1975

[a] Aquatic habitat is the wetted portion of the stream.
[b] Riparian habitat is the wetland streambottom vegetative habitat next to the stream.
[c] Aquatic habitat conditions for sensitive cutthroat trout would improve to good but not excellent due to continued upstream livestock use. Riparian vegetation would probably improve to excellent condition, however.
[d] Home A and B are two channels parallel and adjacent to each other.

success of grazing and resting treatments in riparian zones must allow for recovery (adequate rest) of a poor resource condition before grazing is implemented again at a reduced intensity and season. Mueggler (1975) indicates that 6 to 8 years of protection from grazing are necessary to restore plant vigor and woody riparian plants. This is also supported by BLM studies on Big Creek, Utah (Duff, 1977). Similar studies in Idaho have also found that 5 to 10 years are necessary for the improvement of streambottom gravels, once the sediment-generating impact was alleviated (Platts and Megahan, 1975). This period is relative to the scope and magnitude of sediment sources, but considering that streams act as a dynamic continuum, water quality impacts from upstream use areas would continue to be felt in the rested pasture reach of a stream. In essence, Platts (1972) indicates " . . . rotation type grazing systems may rest pastures but not streambottoms."

The fencing of riparian areas would benefit water quality, vegetation, and wildlife. A summary of impacts to fisheries from the initial action is presented in table 3-14.

Long-term Management

Any proposal for reduction in livestock numbers, change of season of use, and pasture rest would have impacts the same as discussed under the initial action.

Of the 35.5 total miles of ripairan habitat, impacts associated with the initial action would result in 23.5 miles of stream remaining in poor (or unchanged) condition, 3.5 miles in fair (or downward) condition, and 8.5 miles in good (or upward) condition. Since long-term proposed actions would be similar, the impacts to the above mentioned stream conditions would remain the same. Therefore, no change would be expected.

The initial proposed action would provide for protection of riparian habitat on 8.0 miles of streams, of which 6.25 miles is potentially suitable habit for reintroduction of the Bonneville (Utah) cutthroat trout and 1.75 miles is not suitable habitat. Aquatic/riparian habitat on all 8.0 miles of streams would improve. However, exclusion of

TABLE 3-14

Summary of Impacts to Fisheries

Area Affected			
Allotment	Streams	Probable Impacts	Management Action
INITIAL ACTION			
Woodruff Pastures	Birch Creek	Continued decline of fisheries habitat in all streams except in the 1 mile of fenced stream in Laketown Creek.	No change in intensity of grazing. Season long grazing; range readiness through early winter except Laketown to early fall and North Fork Six-Mile to fall. Protective fencing in Laketown.
Rabbit Creek	North Fork Six-Mile Creek		
Sage Creek	North Fork Sage Creek Sage Creek		
Laketown	Laketown Creek		
Meachum Canyon	Home Creek	Declining fisheries habitat on all streams except in the 1.25 miles of fenced stream in Laketown Creek.	Increase intensity of use, protective fencing in Laketown Creek. Range readiness turn-on late spring to early fall or early winter.
Twin Peaks	Laketown Creek		
Middle Ridge	Walton Creek Woodruff Creek		
Duck Creek	South Fork Six-mile Creek North Fork Sage Creek	No significant improvement from reduction in intensity of use. Improved fisheries habitat on 1.75 miles on Randolph Creek, 2.25 miles on North Fork Otter Creek, 0.75 mile on Middle Fork. Otter Creek, 0.25 mile on Spring Creek, and 0.75 mile on Little Creek because of livestock exclusion. Continued improvement in fisheries habitat on 0.5 mile of existing Big Creek exclosure.	Decrease intensity of use. Protective fencing in Randolph Creek, North Fork Otter Creek, Middle Fork Otter Creek, Spring Creek, and Little Creek. Continue exclosure on Big Creek. Range readiness to early fall or early winter.
Big Creek	Big Creek (exclosure) Big Creek (outside exclosure) Randolph		
New Canyon	North Fork Otter Creek Middle Fork Otter Creek South Fork Otter Creek New Canyon Creek Spring Creek Little Creek Old Canyon Creek		
South Woodruff	Home Creek		
LONG TERM MANAGEMENT			
Big Creek Duck Creek Laketown Meachum Canyon New Canyon	Same as under initial action	Increased utilization after treatments would reduce quality of fisheries habitat; possible chemical degradation of habitat due to spraying of 2,4-D; failure of vegetation treatments would result in fisheries habitat being further degraded. Continued improvement in areas fenced in initial action. However, only 3.0 miles of stream (2.25 miles on North Fork Otter Creek and 0.75 mile in Middle Fork Otter Creek) would be acceptable for introduction of sensitive cutthroat trout.	Vegetation treatments; continued fencing of riparian areas.

livestock from the 6.25 stream miles of potentially suitable cutthroat trout habitat would not be totally successful in improving sensitive habitat conditions: 3.0 headwater stream miles of habitat would be successfully improved and would support the cutthroat trout species; 3.25 miles would not be successfully improved since upstream grazing would continue. This would result in 3.0 miles of the total 14.75 stream miles of potentially suitable Bonneville (Utah) cutthroat trout habitat in the Randolph ES area becoming acceptable for reintroduction of the trout species. The remaining 11.75 stream miles would not be acceptable.

The standard design features for the proposed vegetation treatments (0.5 mile streamside buffer strip) would reduce surface distrubance impacts to fisheries habitat. In fact, where successful, habitat may be enhanced since livestock grazing could be more uniformly distributed. For those allotments predicted to be unsuccessful (Soils and Vegetation analyses), negative impacts to fisheries habitat could be expected. The increased erosion would cause increased sedimentation and lower fisheries habitat quality. The magnitude of this impact cannot be quantified since many variables such as the timing of treatment in relation to precipitation, specific methods of treatment, and individual stream flow characteristics and condition would influence the amount and effect of increased sedimentation. Failure of the proposed chemical spray treatments would also reduce fishery habitat quality. Where subsequent seeding was not successful (Soils and Vegetation analyses), increased runoff would occur and discharge toxic chemicals (2,4-D) into nearby streams. Fish populations would be affected negatively should this occur; however, the extent of this impact cannot be quantified because of the above-mentioned variables. Also, since there are likely to be different degrees of success regarding establishment of seedings (Soils analysis), the amount of runoff/erosion would vary, as would the degree of chemical contamination.

The impact of spraying 2,4-D on fish is highly variable and affected by water pH, temperature, water hardness, oxygen content, and dilutant rate. The 50 percent lethal dose (at 48 hours) for rainbow trout is over three times the levels allowed under label directions for application in land vegetation treatments. While minor impacts to fish might be realized, compliance with vegetation treatment design specifications (Appendix 8) would minimize or eliminate adverse impacts.

Nine of the 14 allotments proposed for vegetation treatments have fisheries resources. This represents nine of the 11 allotments in the ES area having fisheries. Total mileage affected by the vegetation treatments involved could be as high as 32.75 miles out of 35.5 miles. However, the actual mileage may be less, depending on the location of treatment areas and whether upper or lower portions of a stream are involved.

A summary of the impacts to fisheries from the long-term management actions is presented in table 3-14.

Conclusions

The fencing of riparian/aquatic habitat would allow 3.0 miles of habitat at the headwaters of the North and Middle Forks of Otter Creek to improve to excellent condition. These waters would be improved sufficiently to accommodate reintroduction of the sensitive Bonneville (Utah) cutthroat trout. Five miles of riparian/aquatic habitat would be improved from fair to good condition (in addition to the good condition in the existing Big Creek Exclosure). There would also be an improvement from poor to fair condition on 3.5 miles of aquatic/riparian habitat. The remaining 23.5 miles of aquatic/riparian habitat would remain in poor condition.

IMPACTS TO ARCHAEOLOGICAL AND HISTORICAL VALUES

According to archaeological investigation and clearance procedures specified in the proposed action, and in compliance with the cooperative agreement between BLM and the Utah State Historic Preservation Office

(Appendix 7) the proposed action would cause little or no impact to archaeological and historical values. Existing inventory information indicates that there are no sites or types of sites which could not be avoided or protected from disturbance resulting from the proposed action; however, the possibility exists that a site could be encountered. If a salvage operation was required at such a location, it is possible that scientific information may be destroyed that could have been better collected at some time in the future with improved techniques.

IMPACTS TO VISUAL RESOURCES

Visual impact, which is defined as contrast with an area's characteristic landscape, would not be noticeable during the initial implementation phase. Proposed range improvement projects would be designed to fit in with the area's characteristic landscape (Chapter 1). There would, however, be an increase in the number of range management facilities over that presently seen on the landscape (fences, developed springs, etc.). The 78 miles of fence proposed in the long term would not result in significant visual intrusion; similarly, 7 miles of fenced riparian livestock exclosures would not be out of character with the existing landscape because fencelines are common in the area and lush natural vegetation inside the fences would appear to be in harmony with the surrounding landscape. However, proposed fencing at the bottom of Laketown Canyon in the Proposed ACEC area would adversely affect management objectives to preserve or improve scenic and natural resources.

The extensive vegetation treatments proposed in the long term could result in major alteration of vegetation colors, patterns, and surface textures. Design and success of revegetation projects would be critical since the chance exists for creation of a landscape obviously altered by human actions and in stark contrast with the characteristic natural landscape. Only slight and/or temporary (2 years or less) visual contrasts would be evident, since aesthetic design and constraints as proposed in Chapter 1 would be followed. Therefore, long-term visual impacts would be minimized.

IMPACTS TO LAND USE

Agriculture (farming)

Since almost all arable land in Rich County is already in use, it is doubtful that any more intensification in agricultural activity would occur. However, proposed changes in season of use (e.g., later turn-ons, earlier turn-offs), could require that herds be retained on base property longer in the spring or earlier in the fall, possibly causing changes in base property use. If these changes (livestock staying longer in the meadow hay production areas) affect the ranchers' existing hay production schedules to any appreciable amount, there would be a potential for negative economic impacts.

Livestock Grazing

Long-term management actions proposing increases in AUMs would allow ranchers to increase herd sizes. In actuality, despite the proposed increase in allowable public land AUMs, a limiting factor to herd sizes could be ranchers' ability to provide and/or obtain feed for livestock when they have been turned-off public lands and returned to base property.

In addition, actions proposed herein would require closer supervision of herds by ranchers and increased workloads involved in moving livestock when full allowable use of pastures has been reached. Operators may also be required to remove livestock from certain pastures for as long as 2 years while seedings become established, resulting in a demand for other pasturage for the animals during the interim. Sufficient additional pasturage may not be available to operators to make this adjustment.

It is anticipated that implementation of the proposal would impose an increased workload on BLM Salt Lake District Office to administer reductions, restrictions, management decisions, and possible trespass problems. This increased workload would also require additional funds and personnel being made available to BLM. No exact numbers of additional employees or increased costs can be determined until a final range management program is selected and implementation begins.

Recreation

The proposed action contains short and long-term range management proposals that would affect recreational resources. It should be noted that the proposed long-term monitoring program is designed to ensure compliance with range management and enhancement or protection of recreational resources as discussed below.

Some improvement in fishing opportunities may occur on selected portions of the following streams through exclusion of livestock use:

	Miles	Allotment
Little Creek	0.75	New Canyon Allotment
Middle Fork Otter Creek	0.75	New Canyon Allotment
Randolph Creek	1.75	Big Creek Allotment
Spring Creek	0.25	New Canyon Allotment
Laketown Creek	1.0	Laketown Allotment
Laketown Creek	1.25	Twin Peaks Allotment
North Fork Otter Creek (upper)	2.25	New Canyon
TOTAL	8.0	

However, overall fishing opportunities would not be expected to improve significantly over existing conditions since the proposed fencing of 8 out of 35.5 miles of stream reaches on public land is not considered to be sufficient to noticeably affect this recreation activity.

The streams with the greatest improvement potential are Little, Middle Fork Otter (Upper), Randolph, and Spring Creeks. Laketown Creek, which already has fairly good fishing, receives some natural protection from overuse due to the rugged nature of Laketown Canyon. The North Fork of Otter Creek (Upper) has a small channel which is sometimes dry and which could, at best, provide only marginal sport fishing opportunities if waterflows were improved.

On the remaining 11 streams in the ES area (table 3-13, Wildlife and Fisheries sections) livestock restraining measures, changes in season of use, reductions in allocations on most allotments, and the range monitoring program may cause some noticeable improvement in aquatic stream habitats.

Success at managing for improved fishing on streams outside the exclosures would depend almost entirely on how well the wet meadow and critical streambank areas can be protected from excessive livestock foraging and trampling. Management efforts other than those that would strictly control livestock grazing on riparian areas would result in no noticeable improvement.

Fishing quality may improve in the reservoirs listed in table 2-20 if sedimentation rates are reduced and cold water inflow becomes more stable. Slow improvement could occur as upstream watersheds stabilize through changes in season of use and adjusted stocking levels.

Utah DWR reports deer herds are increasing (Chapter 2, Wildlife). In most instances, insufficient forage exists to meet deer needs. The proposed action would decrease deer forage (Chapter 3, Wildlife). Therefore, deer hunting opportunities would decline from existing conditions.

A less direct correlation can be made between sage grouse habitat and populations. Public land in Rich County does provide an important component of sage grouse habitats. The wet meadow areas adjacent to active sage grouse strutting and nesting grounds provide a source of high quality, abundant food to sage grouse, especially the young (Chapter 3, Wildlife). Sage grouse hunting opportunities are related to the condition of these wet meadow areas (fig. 2-15). If the condition of these areas improves, sage grouse populations may increase and hunting opportunities improve. The initial action would not improve sage grouse habitat significantly, neither would the long-term management; therefore, hunting opportunities would not be expected to change. The wildlife section contains more detail on sage grouse impacts.

Wildlife viewing opportunities should improve with the initial phase of the proposed action, particularly in the protected riparian areas, because more healthy diverse vegetation would cause improvement and creation of a wider variety of wildlife habitats for large and small mammals, raptors, songbirds, insects, reptiles, etc.

The livestock exclusions at Woodruff Creek (3 acres), and New Canyon (4 acres) would improve quality camping opportunities by eliminating livestock problems at two camping spots. Most camping outside the developed sites occurs on wet meadow (riparian) streamsides. The quality of camping experiences in these areas would continue to be degraded from livestock presence and evidenced by lack of grass in trampled areas, dust, insects, etc. (Randolph URA).

Conclusion

Riparian vegetation would noticeably improve on the 8 miles of stream reaches proposed for fencing; however, fishing quality would not improve significantly since the proposed fenced areas cover only about one-fourth of the total streammiles involved.

It is anticipated that the loss of deer forage as a result of the proposed action would reduce deer herd levels from present numbers.

Wilderness

No wilderness study areas would be affected by the proposed action (see Chapter 2, Wilderness).

Plans, Controls, and Constraints

The proposed action could initiate new or revised agreements such as the range management agreements between the Forest Service and BLM. The proposal would cause a conflict with existing and proposed ranch plans being developed between SCS and private-land ranchers who are also BLM permittees. The proposal would affect private lands within Bear Lake, East Woodruff, and Meachum Canyon Allotments as follows:

SCS has drawn up a two-pasture deferment grazing system for the Bear Lake Allotment, but no reduction in current grazing levels. BLM would propose a three-pasture deferred grazing treatment plan and a 25-percent stocking reduction.

SCS has an existing plan affecting the East Woodruff/Meachum Canyon allotments which would have to be modified to comply with BLM requirements (on public lands only). SCS considers such modifications to be minor and anticipates no major problems (personal communication SCS, February 1979).

Of the 84 permittees grazing on the 19 allotments in the Randolph Planning Unit, 12 jointly graze the Uinta Allotment in the Crawford Mountains (located in Rich County but excluded from the planning unit), administered by the BLM Rock Springs District Office, Wyoming. This Uinta Allotment will be included in the Pioneer Trails Grazing Management ES scheduled for completion in 1985. Depending upon survey-inventory findings and the ES proposals, these 12 ranchers could face future impacts to their operations, in addition to those received as a result of initial and long-term actions proposed by this ES.

IMPACTS TO RANCHER ECONOMICS

The categories of direct socioeconomic impacts which would likely result from the implementation of the proposed action are: (1) changes in gross income levels; (2) changes in ranch expenses; and, (3) possible alteration of established base property use patterns. These types of changes would occur to all three ranching operations, though to differing degrees and possibly at different points in time. The actions which would initiate these changes are: (1) increases or decreases in permit sizes; (2) shifting of current seasons of use; and, (3) implementation of grazing systems. The timing of the potential impacts would occur in two phases, initial action and long-term management.

The following analyses were made using actual livestock use data to represent the existing situation and the potential authorized use (the amount of forage a rancher would be authorized after treatments, etc.) to represent the future situation. This may appear to bias the analysis somewhat because actual use is often less than authorized use. It was assumed that the livestock industry could utilize the additional grazing capacity.

In the Rich County area, the social/cultural impacts would be secondary to and largely derived from the direct economic impacts to livestock operations. The primary impacts would not be distributed evenly over all segments of the Rich County population since not all residents are directly involved in agriculture. The proposed action could potentially impact roughly half of the agricultural proprietorships (84 out of 168 ±) directly.

Initial Action

Impacts to Local Values and Attitudes

Of the five Rich County communities, only three (Laketown, Randolph, and Woodruff) have the potential of being directly impacted by the initial action. Table 3-15 displays the distribution of initial action changes in AUMs. Of the three affected communities, it appears that Laketown ranchers would receive the highest average percent reduction in AUMs (14 percent). However, the 16 individuals involved represent only 7 percent of the town population and it is, therefore, not anticipated that the initial action would precipitate any major sociological or economic changes in the community itself. The same is true of Randolph and Woodruff, both of which would receive smaller percentage reductions in AUMs.

Small Scale Operations

The initial action would result in a 5-percent reduction in the average number of AUMs for the small rancher. These AUM impacts are translated into budgetary terms in table 3-16, column 2.

The effects of the initial action on the small ranch budget would be essentially reductions in gross and net incomes. The percentage

TABLE 3-15

Distribution of Average Initial Action AUM Changes by Ranch Scale and Community

	Ranch Scale			Community			
	Small	Medium	Large	Laketown	Randolph	Woodruff	Outside Rich County
Percent change	(-5)	(-2)	1	(-14)	(-6)	7	4
Number of operators affected	43	31	30	16	47	33	8

NOTE: The entries in the above table depend upon the combination of the changes in grazng capacities in specific allotments and the predominant ranch scale or the predominant hometown residence of those individuals using those allotments. Therefore, if small scale ranches are the primary users of the allotments which would receive the largest cuts, then the entry for the small scale would be a larger negative than those for the other scales. If the allotments which are used primarily by ranchers from Woodruff received the largest increases in grazing capacity, then the entry for Woodruff would be larger than those for the other communities. There is, however, no direct correlation between the Ranch Scale side of the table and the Community side.

reduction in net income would be larger than that in gross income because fixed costs remain constant while total revenues decrease.

The average small scale operator (except for the 13 ranchers in Woodruff Pastures) may receive an approximate 2-week delay in his normal turn-on date if range readiness factors do not allow him to graze until June 1 (Appendix 5). This could have the effect of forcing the rancher to hold his herd on base property longer than normal which, in turn, would modify the ways in which he might be able to use his property e.g., for the production of hay. There are no data available which would allow a comprehensive analysis of the effects which this impact

TABLE 3-16

Small Scale Ranch Short Term/Long Term Budget Impacts

	Present[a]	Initial Action[b] (grazing adjustments)	Long Term[c] Management (initial action, management, and treatments)
AUMs	1,022	971	1,284
INCOME			
Calf, yearling, cow, bull	$9,218.00	$8,757.00	$11,615.00
Lamb, ewe, ram, wool	....	....	....
TOTAL INCOME	9,218.00	8,757.00	11,615.00
Change from present	....	(-461.00)	2,397.00
COSTS			
Fixed costs[d]	4,998.00	4,998.00	5,082.00
Variable costs	2,793.00	2,653.00	3,519.00
TOTAL	7,791.00	7,651.00	8,601.00
Change from present	....	(-140.00)	810.00
NET INCOME	1,427.00	1,106.00	3,014.00
Change from present	....	(-377.00)	1,587.00
NET INCOME PER AUM	1.40	1.14	2.35
Change from present	....	(-0.26)	-0.95
BREAK-EVEN POINT	$7,171.00	$7,171.00	$7,291.00
Change from present	....	....	[e]120.00

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[a] From table 2-22.
[b] Figures based upon percentages in table 3-15.
[c] Figures based upon percentages in table 3-19.
[d] Average fixed cost per scale computed by the sum of fixed costs per scale.
[e] A larger break-even number represents a negative financial shift for the operator.

could precipitate, so no specific projections can be made at this point as to how this action would impact the small rancher's viability. However, if the action inhibits the rancher's hay production to any large degree, there is the potential for a negative impact.

Medium Scale Operations

Initial action impacts to medium scale operations would result in a short term 2-percent reduction in numbers of allotted AUMs on the average when compared to the current average stocking level.

The effects of these AUM reductions on the medium scale ranch budgets are presented in column 2 of table 3-17. The overall impact would be an average $259 reduction in net income. This occurs even though the average medium scale rancher is already operating at a $10,903 deficit.

The average rancher in this scale may also receive an approximate 2-week delay in his normal turn-on date if range readiness factors do not allow him to graze until June 1. Resulting impacts would be similar to those previously discussed for small scale ranchers.

Large Scale Operations

Impacts to the large scale ranchers, in contrast to the small and medium operations, are mostly positive. On the average, the initial action should yield a 1-percent increase in the number of AUMs allotted to these operators, compared with average actual use over the past few years. Table 3-18 translates the 1-percent increase in AUMs into budgetary terms. The AUM increase would yield an average of $178 per year increase in net revenue.

The average large operator may also receive an approximate 2-week delay in his normal turn-on date if range readiness factors do not allow him to graze livestock until June 1 with impacts similar to those discussed for small and medium scale ranchers.

Long-Term Management

Social/Cultural Values

Table 3-19 shows the distribution of AUM changes on Rich County communities in the long-term proposed management. Such an array assumes

TABLE 3-17

Medium Scale Ranch Short Term/Long Term Budget Impacts

	Present[a]	Initial Action[b] (grazing adjustments)	Long Term[c] Management (initial action, management, and treatments)
AUMs	3,530	3,459	4,589
INCOME			
Calf, yearling, cow, bull	$32,351.00	$31,704.00	$42,056.00
Lamb, ewe, ram, wool	4,326.00	4,239.00	5,624.00
TOTAL INCOME	36,677.00	35,943.00	47,680.00
Change from present	....	(-734.00)	11,003.00
COSTS			
Fixed costs[d]	23,816.00	23,816.00	23,985.00
Variable costs	23,764.00	23,289.00	30,893.00
TOTAL	47,580.00	47,105.00	54,878.00
Change from present	....	(-475.00)	7,298.00
NET INCOME	(-10,903.00)	(-11,162.00)	(-7,198.00)
Change from present	....	(-259.00)	3,705.00
NET INCOME PER AUM	(-3.09)	(-3.23)	(-1.57)
Change from present	....	(-0.18)	1.52
BREAK-EVEN POINT	$67,645.00	$67,645.00	$68,124.00
Change from present	....	....	[e]479.00

[a] From table 2-22.

[b] Figures based upon percentabes in table 3-15.

[c] Figures based upon percentages in table 3-19.

[d] Average fixed cost per scale computed by the sum of fixed costs per scale (for all allotments divided by total number of operators per scale.

[e] Larger break-even number represents a negative financial shift for the operator.

TABLE 3-18

Large Scale Ranch Short Term/Long Term Budget Impacts

	Present[a]	Initial Action[b] (grazing adjustments)	Long Term[c] Management (initial action, management, and treatments)
AUMs	7,632	7,708	9,998
INCOME[d]			
Calf, yearling, cow, bull	$109,818.00	$110,916.00	$143,862.00
Lamb, ewe, ram, wool	....	....	....
TOTAL INCOME	$109,818.00	$110,916.00	$143,862.00
Change from present	....	1,098.00	34,044.00
COSTS			
Fixed costs[e]	48,820.00	48,820.00	49,150.00
Variable costs	17,768.00	17,946.00	23,276.00
TOTAL	66,588.00	66,766.00	72,426.00
Change from present	....	178.00	5,838.00
NET INCOME	43,230.00	44,150.00	71,436.00
Change from present	....	920.00	28,206.00
NET INCOME PER AUM	5.66	5.73	7.15
Change from present	....	0.07	1.49
BREAK-EVEN POINT	$58,243.00	$58,243.00	$58,637.00
Change from present	....	....	[f](-394.00)

[a] From table 2-22.

[b] Figures based upon percentages in table 3-15.

[c] Figures based upon percentages in table 3-19.

[d] These figures include nonlivestock based incomes from other aspects of the ranch operation which cannot be separated on the basis of the information available. This aspect inflates the "per AUM" figures considerably.

[e] Average fixed cost per scale computed by the sum of fixed costs per scale (for all allotments) divided by total number of operators per scale.

[f] A larger break-even number represents a negative financial shift for the operator.

TABLE 3-19

Distribution of Long-Term Percent AUM Changes by Ranch Scale and Community

	Ranch Scale			Community[a]			
	Small	Medium	Large	Laketown	Randolph	Woodruff	Outside Rich County
Percent change	26	30	31	17	33	29	25
Number of[b] operations affected	43	31	30	16	47	33	8

[a] These figures represent the average change in AUMs for permittees of all scales who reside in each respective community.

[b] Some double counting exists because of some permittees operating in more than one allotment.

NOTE: The entries in the above table depend upon the combination of the changes in grazng capacities in specific allotments and the predominant ranch scale or the predominant hometown residence of those individuals using those allotments. Therefore, if small scale ranches are the primary users of the allotments which would receive the largest cuts, then the entry for the small scale would be a larger negative than those for the other scales. If the allotments which are used primarily by ranchers from Woodruff received the largest increases in grazing capacity, then the entry for Woodruff would be larger than those for the other communities. There is, however, no direct correlation between the Ranch Scale side of the table and the Community side.

that the basic configuration of small, medium, and large scale ranches would not be changed significantly by either the initial action or long-term management.

It is not anticipated that any major shifts in average county employment, income, or population trends would result from the implementation of the proposed action.

The most detectable social/cultural impacts would be in the area of local values and attitudes. The ranching lifestyle permeates the attitudes of virtually all Rich County residents whether they derive their livelihood directly from ranching or not. The proposed action may be interpreted by local residents to represent restrictions to this base lifestyle and thereby affect residents' perceived values and attitudes in two overall ways: (1) by suggesting controls on the individual rancher's freedom to conceive and implement his own decision-making process; and (2) to reduce the county's autonomy and freedom from outside interference.

Small Scale Operator

The small ranchers would receive a 26-percent net increase in allotted numbers of AUMs over the long term. This figure represents a net increase, taking into account the initial action reductions and the assumed eventual addition of grazing capacity through management and treatments, compared with the average active use levels.

Column 3 of table 3-16 indicates that despite long-term increases in both fixed and variable costs, increases in revenues would more than compensate, leaving the average small operator with about $2,400 per year gross income more than at the present time. His net income rises from $1.40 per AUM to $2.35 per AUM, an increase of $0.95.

Medium Scale Operator

Impacts to these ranchers appear to be largely beneficial (column 3, table 3-17). Although the figures for net income indicate that the average medium scale rancher may still be operating at a deficit, his overall position would be appreciably improved over the past average. The deficit net income per AUM would be reduced from -$3.05 to -$1.57.

Also, such additional AUMs may replace some of the medium scale operator's reliance on purchased feed ($14,000 annually, table 2-22, Ranch Budget Sheets). Reducing such costs by 70 percent may put this scale into a profitable position.

Large Scale Operator

The impact on the large scale operators should also prove to be beneficial. The average increase in AUMs is nearly 31 percent (table 3-18) which yields a substantial increase in both net revenue and net revenue per AUM. This latter result derives from the fact that the rancher's fixed costs can be proportioned over a much larger number of AUMs, raising the net revenue per AUM amount by nearly 25 percent the current average (table 3-18, columns 1 and 3) from $5.66 per AUM to $7.15.

Potential Impacts from Treatments

As noted in Land Use section this chapter, there may be restrictions to grazing for as long as 2 years after seedings have been performed. As a means of estimating how this might affect the three ranch scales during the long term, the following assumptions and calculations were made in order to establish a "worst case" example.

1. Assume that no other grazing land is available upon which to displace the temporarily lost AUMs.
2. Assume that the lost AUMs would be supported for the normal season of use on purchased hay at $65 per ton.
3. Assume 800 pounds of hay would be needed to support one animal for 1 month.
4. Assume that the proposed AUM levels apply after the initial action adjustments have been made.
5. Assume that seasonal dependency percentages (from table 2-23) apply.
6. Assume that grazing fees for two seasons would not be paid.

This would lead to the following results: ($65 per ton for hay) (.40 tons of hay per head per month) (12 months grazing lost) equals $312 per head for the total period as a constant. Applying this figure to each size class, one obtains:

Small Scale ($312 per head) (62 head total) (.42 dependence) = $8,124.

Medium Scale ($312 per head) (277 head total) (.24 dependence) = $20,741.

Large Scale ($312 per head) (541 head total) (.34 dependence) = $57,389.

Offsetting some of these expenses somewhat are the grazing fees foregone for the two seasons lost, yielding:

Small Scale $8,124 - $533 = $7,591 maximum costs.

Medium Scale $20,741 - $1,476 = $19,265 maximum costs.

Large Scale $57,389 - $2,858 = $54,531 maximum costs.

These figures represent the maximum amount of additional variable costs which might be incurred by the average operator in each class for a 2-consecutive-year grazing season restriction. This would occur in all allotments scheduled for seedings at the interface between the initial action and the long-term management phases of the proposed action. These expenses would be reflected as additions to the operators' variable costs.

Summary of Long-Term Economic Impacts

All three ranch classes appear to have been aided in the long term by the proposed action (providing the increased level of forage production is maintained). However, it is still evident that the medium scale remains in a tenuous position (table 3-20). This being the case, it seems reasonable to expect that the national trends toward larger, more capital-intensive livestock operations would become more prevalent in Rich County and that many of the medium-sized ranchers may either leave the business for other employment or retire without passing the ranch on as a family based operation. It is difficult to project a future trend for the small scale rancher. The long-term proposed actions tend to favor the small scale with higher profits, although profit margins seem to be less crucial with these operators because of their reduced dependence on ranching as the sole source of livelihood. It seems reasonable to project that there would be no major shifts in the numbers of small

TABLE 3-20

Long-Term Ranch Economics Summary

	Small Scale	Medium Scale	Large Scale
AUMs	1,284	4,589	9,998
Gross Income	$11,615.00	$47,680.00	$143,862.00
Fixed costs	5,208.00	23,985.00	49,150.00
Variable costs	3,519.00	30,893.00	23,276.00
TOTAL COSTS	$8,601.00	$54,878.00	$72,426.00
Net income	$3,014.00	(-$7,198.00)	$71,436.00
Break-even point	$7,291.00	$68,124.00	$58,637.00

scale ranchers in the next 10 to 20 years. This projection could be altered if some of the medium scale ranchers reduce their operations and, essentially, transfer into the smaller class.

In general, the long-term proposed increases in AUMs should help to appreciate the capital values of the ranchers' grazing permits, assuming that the increases in AUM numbers available on BLM lands do not increase the level of the ranch dependencies on "nonbase" grazing. The maximum sales value of the grazing permit (Appendix 15) would remain unchanged.

Conclusions

The most pronounced impacts to local values and attitudes would occur at the implementation of the proposed action because of the magnitude of change that would be incurred by ranchers. The primary attitudinal impacts would derive from the effects that BLM management actions have on rancher incomes. Small scale ranchers would incur a 22-percent reduction in net ranch income from the initial action (table 3-16), but a 111-percent potential increase in the long term. The medium scale ranchers would experience a 2-percent reduction in net ranch income in the short term, but a 51-percent potential increase over the long term (table 3-17). Large scale ranchers would receive a 2-percent increase in the short term and a 65-percent potential increase in net ranch income in the long term (table 3-18).

It is not anticipated that implementing the proposed action would result in any substantial modification of the Rich County livestock industry on the whole. Some individual operators, especially in the medium scale, who are currently in a marginal position may leave the business or reduce their level of involvement by taking on other employment. Despite long-term potential increases in incomes, it is likely that those operations in the medium scale will experience continued difficulty in attaining a reasonable profit and many may eventually leave the industry.

CHAPTER 4

MITIGATING MEASURES NOT INCLUDED IN THE PROPOSED ACTION

CHAPTER 4

MITIGATING MEASURES

Mitigating measures that would be applicable to the proposed action are set forth under Design Restrictions and Standard Operation Requirements for Range Developments section plus provisions contained in Administrative Options and Flexibility section, both contained in Chapter 1 and Appendix 8, Summary of Project Design Specifications.

CHAPTER 5

ANY ADVERSE IMPACTS WHICH CANNOT BE AVOIDED SHOULD THE PROPOSAL BE IMPLEMENTED

CHAPTER 5

ADVERSE IMPACTS WHICH CANNOT BE AVOIDED SHOULD THE PROPOSAL BE IMPLEMENTED

INTRODUCTION

Design restrictions and standard operation requirements presented in Chapter 1 would reduce or avoid some of the adverse impacts that could result from implementation of the proposed action. No additional mitigating measures were identified in Chapter 4; therefore, this chapter is a summary of adverse impacts identified in Chapter 3 which cannot be avoided if the proposed initial and/or long term management actions are implemented. Since there were no significant adverse impacts to climate, geology, or topography identified in Chapter 3, these resources will not be addressed in this chapter.

AIR QUALITY

Initial Action

There would be no appreciable change in air quality in the Randolph ES area from the proposed initial management action.

Long-Term Management

Negative impacts from burning sagebrush would occur over the period of the burn (a few days at most). Emissions from sagebrush burning include heat, gasses, and particulate matter. The majority of the gasses released would be nitrogen oxides, carbon monoxide, and hydrocarbons. Since the National Ambient Air Quality Standards (NAAQS) regarding nitrogen oxides are based on an annual average basis (as nitrogen dioxide), the burnings are not anticipated to violate the NAAQS. The short term NAAQS for carbon monoxide (8-hour and 1-hour), particulate matter (24-hour), and hydrocarbons (3-hour, 6:00 to 9:00

a.m.) could be approached or exceeded. These negative impacts from a burn would be felt over the immediate area of the burn and would decrease rapidly with distance.

Herbicide application by aircraft would involve spraying of a mixture of 2,4-D, carrier (the material in which the herbicide is suspended), and small amounts of other additives (emulsifiers and wetting agents). Although the herbicide would be applied in a manner to maximize the amount of herbicide reaching the ground, some of the emulsion would disperse into the atmosphere due to its volatile nature. The amount of this dispersed herbicide is unknown, but studies have shown the impacts to be negligible.

SOILS

Initial Action

No adverse impacts identified.

Long-Term Management

An increase in livestock grazing intensity would result in added soil compaction and a reduction of surface cover within the Meachum Canyon Allotment. Erosion is expected to increase on the 390 acres of native range.

Erosion would increase on 5,072 burned acres until the newly seeded plants establish themselves (1 to 2 years). The anticipated unsuccessful seedings (53 percent) would increase both the duration and severity of the soil loss up to a maximum of about 5 years.

After complete implementation of the proposed action, soil erosion would be increased on 506 acres (table 3-4). Impacts cannot be predicted for the 2,611 acres of land proposed for disposal and the 7 acres proposed for recreation development.

VEGETATION

Initial Action

There would be continued overutilization of desirable species on 83,428 acres due to utilization rates exceeding 50 percent on Woodruff Pastures, South Woodruff, Eastman, Bear Lake, Big Creek, Duck Creek, and New Canyon (table 3-5). Due to the procedure employed to allocate forage between cattle, sheep, and wildlife, it appears that quality forage would be under-allocated to wildlife, which would result in overutilization of species preferred by both deer and livestock on critical deer winter range and deer summer range.

The quantity of forage available to livestock would decrease 104 AUMs by fencing 208 acres of riparian habitat.

Long-Term Management

There would be an initial decline in livestock forage condition, composition, and density of key species, forage production, apparent trend and plant vigor from vegetation treatments on 65,187 acres. In the event of seeding failure, an increase in annuals, forbs, and other undesirable species would occur in the treatment area on as much as approximately 34,000 acres.

The benefits from grazing and resting treatments, level of use adjustments, range readiness turn-on date, changes in season of use, and range development would not improve condition or forage production, except in the short term within 5 to 10 years after the seedings. There would be a decline in production after the seedings from 25,400 AUMs (table 3-7) to pretreatment levels of 22,350 AUMs.

Loss of 104 AUMs for livestock from riparian habitat fencing would carry over from the initial action.

Overutilization on critical deer winter range (16,800 acres) and deer summer range (123,498 acres) would carry over from the initial action.

Construction of proposed projects (fences, pipelines, wells, and troughs) would remove vegetation on 116 acres in the ES area.

Revegetation would be partially established in 5 years. Where revegetation failed, sites would revegetate naturally to annuals, forbs, and other less desirable species.

Conclusion

Generally, the proposed action would not measurably change the livestock forage condition, vigor, density, or production in the long term. The livestock forage condition rating would still be at pretreatment levels of good - 41, fair - 54, and poor - 5 percent, respectively, and the objectives to improve the livestock and wildlife forage production would not be attained.

WATER

Initial Action

There would be increased streambank sloughing and sedimentation in Home and Laketown Creeks as a result of increases in grazing intensity on Meachum Canyon and Twin Peaks Allotments. The impacts on water quality from disposal of 2,611 acres and withdrawal of 7 acres proposed for recreation site developments are unknown.

Long-Term Management

Vegetation manipulation in Bear Lake, Big Creek, Dry Basin, Duck Creek, Kearl, Laketown, Meachum Canyon, New Canyon, Rabbit Creek, Sage Creek, Twin Peaks, and Woodruff Pastures Allotments would cause increased runoff, sedimentation, and/or possible chemical pollution from herbicides. Streams or reservoirs that may be affected are: Bear Lake, Randolph Creek, Big Creek, Old Canyon Creek, Six-Mile Reservoir, North and South Forks of Six-Mile Creek, North and South Forks of Sage Creek, Laketwon Canyon Creek, Home Creek, North, Middle, and South Forks of Otter Creek, New Canyon Creek, Spring Creek, Little Creek, Little Creek Reservoir, Birch Creek, and Birch Creek Reservoir.

The increased runoff and sedimentation would result from the loss of litter and cover after burning. Chemical pollution would result after spraying. The increased runoff and sedimentation would be short-term impacts and would be continually reduced once the seeding becomes established. The chemical pollution would be short term and would last only for a few hours after the actual spraying since the decay rate of the 2, 4-D emulsion used in spraying is rapid.

WILDLIFE

Major quality forage shortages would develop on all fair and poor condition ranges from livestock use of the preferred deer forage and the failure of proposed management to provide the additional AUMs necessary to feed the expanding deer herds. Critical deer winter range in Woodruff Pastures would remain in poor condition from absence of preferred species. These conditions would produce overgrazing on and decline of the preferred deer forage, followed by malnutrition and possible starvation within the deer herds. The deer herds could not increase to the UDWR desired levels.

Table 5-1 shows the projected long term deer forage quantity shortages.

Eight known sage grouse populations would experience major to severe alteration of their habitat from vegetation treatments. All seventeen known complexes would experience a continued decline of cover and forage from the grazing treatments. Sage grouse populations would decline or abandon the area.

Twenty-seven miles of riparian habitat would continue to decline to very poor condition, providing minimal use to wildlife. Wildlife dependent upon riparian areas would decline in diversity and population size. Some species would die and others would abandon the areas.

TABLE 5-1

Future Deer Bulk Forage Allocations

	Seasonal AUMs			Critical Deer Winter Range AUMs		
Allotment	Total	Demand	Shortfall	Total	Demand	Shortfall
Bear Lake	.....	.....	.....	184	217	33
Big Creek	1,610	1,646	36	172	227	55
Deseret	.....	.....	.....	751	68	.....
Dry Basin	337	564	227	.....	.....	.....
Duck Creek	537	678	141	.....	.....	.....
Eastman	258	330	72	68	150	82
East Woodruff	172	518	346	.....	.....	.....
Kearl	55	235	180	.....	.....	.....
Laketown	112	188	76	118	184	66
Meachum Canyon	132	186	54	37	67	30
Middle Ridge	.....	251	251	.....	.....	.....
New Canyon	2,464	2,622	158	.....	.....	.....
Rabbit Creek	202	395	193	.....	.....	.....
Sage Creek	647	1,254	607	.....	.....	.....
Session	.....	40	40	.....	.....	.....
South Woodruff	171	414	243	408	646	238
Stuart	.....	.....	.....	188	255	67
Twin Peaks	87	461	374	.....	.....	.....
Woodruff Pastures	1,187	1,286	99	1,320	2,704	1,384
TOTAL	7,971	11,068	3,097	3,246	4,518	1,955

FISHERIES

Initial Action

There would be continued decline on 27 miles of riparian habitat on the ES area. BLM would lose management opportunities on 1.75 miles of riparian habitat through disposal of the Middle Ridge Allotment.

Long-Term Management

Habitat value and condition would continue to decline on 25.25 miles of riparian habitat, of which 11.75 stream miles are potentially suitable habitat for the Bonneville (Utah) cutthroat trout. This trout is a sensitive species proposed for reintroduction into the ES area.

ARCHAEOLOGICAL AND HISTORICAL VALUES

Vegetation treatments may disturb presently unknown archaeological and historical sites within the planning unit. Increased erosion from the treated areas may cause a loss to archaeological and historical values.

VISUAL RESOURCES

Vegetation treatments and range developments would reduce the aesthetic value of the landscape.

Fencing at the bottom of Laketown Canyon in the proposed ACEC area would adversely affect management objectives to preserve or improve scenic and natural resources.

LAND USE

Later turn-on and/or earlier turn-off dates under the change in season of use would require longer periods of livestock grazing on base property. This may conflict with hay production on the operators' private lands.

Implementation of the proposal would impose increased workloads on the BLM Salt Lake District Office to administer management actions. This would require additional funds and personnel being made available to BLM.

Recreation

Forage losses to deer would cause deer hunting opportunities to decline.

Disturbance of sage grouse complexes through vegetation treatments and subsequent losses of sage grouse populations would reduce hunting opportunities.

SOCIOECONOMICS

The adverse impacts associated with socioeconomics result primarily from initial action reductions in grazing capacities. The long-term management proposal tends to compensate for the initial cuts by eventually returning lost AUMs or by yielding net increases in grazing capacity in most allotments. It is, therefore, concluded that over all, there would not be long-term adverse economic impacts. However, it is anticipated that despite long-term increases, there would remain an attitudinal resistance and hostility on the part of livestock operators toward any proposed controls, reductions, monitoring programs (such as ear-tagging), etc., with would impinge on their normal operations.

If season of use changes and/or post vegetation treatment grazing restrictions result in operators having to purchase feed to support "lost AUMs", the results would soon be catastrophic. Net incomes per AUM would drop to zero or worse in less than 3 months of feeding hay (at $65 per ton and 800 pounds per animal unit per month) for the most profitable operations, more rapidly for the less profitable.

Some allotments would receive initial reductions which would either be carried into the long-term management or would be only partially replaced in the long term. These allotments and their long-term impacts are reductions of: Bear Lake - 14 percent; Eastman - 6 percent; Kearl - 62; and South Woodruff - 14 percent. The individuals using these allotments would incur both short and long-term losses in AUMs and, subsequently, losses of income. Two operators in the small ranch size class would receive an average 6 percent reduction; two medium size operators would receive an average 38 percent reduction; and three large size operators would receive an average 37 percent reduction. However, there would be no adverse impacts to any of the ranch size classes taken as a whole.

CHAPTER 6

RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

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RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

This chapter discusses long-term productivity of the environment which would be affected by the implementation and operation of the proposed action. The timeframe in which this relationship is analyzed is not the same as in the proposed action. The short-term period refers to the 20 years during which the objectives of the proposed action are expected to be accomplished. Long term refers to the time after attainment of proposed objectives when subsequent effects of the proposed action would still impact the environment.

Although air quality standards would not be violated, spraying of herbicides or burning would reduce air quality 3 days annually during those periods in the short term when such activities were taking place (5-year period). No significant long-term impacts to air quality are anticipated.

There would be increased erosion on 5,188 acres over a 12-year period in the short term. Twenty years after implementation, soil erosion would: (1) be reduced on 72,413 acres, decreasing sediment loads, and improving water quality in streams draining treated areas; (2) remain unchanged on 64,761 acres, and (3) would increase on 506 acres of public land. Increased sediment loads and decreased water quality would occur in Home Creek and Laketown Creek. It is probable that this situation would continue into the long term unless the monitoring programs discussed in Appendix 8 result in adjustments that would further reduce soil erosion.

In the short term, proposed vegetation treatments and water developments would increase livestock forage by 2,256 AUMs and wildlife forage by 2,865 AUMs. Riparian vegetation on 208 acres would be improved to excellent condition through exclusion of livestock use.

Riparian vegetation and water quality on the 208 acres would continue to improve throughout the long term until climax vegetation condition was achieved. Due to a dietary overlap between livestock and deer (Appendix 6) and the increased intensity of livestock use on the seedings, it is expected that the increased amounts of livestock and wildlife forage up to 36,700 AUMs would decline to pretreatment levels of 30,785 AUMs in the long term. Overuse of key forage plants by wildlife and livestock would result in a decline in the vigor and productivity of these plants. This, in turn, could cause the condition of the existing deer herd to decline and may reduce deer numbers. The potential deer herd size suggested by Utah Division of Wildlife Resources (9,036 animals) would not be achieved. Eight or more sage grouse populations would have a major portion of their habitat removed, resulting in the possibility of a reduction of sage grouse numbers.

Grass and forb vegetation on 27 miles of unfenced streambanks would increase in vigor and density as a result of deferring livestock use in both the short and long term, but the willows and other woody vegetation would decline in condition, vigor, density, and production.

As a result of fencing 208 acres of riparian vegetation, 3 miles of fisheries habitat would improve to excellent condition and 5.5 miles would improve to good condition. This improvement would occur in the short term and extend into the long-term period.

Long-term impacts would result in the loss of habitat suitable for introduction of Bonneville (Utah) cutthroat trout on 7 of 10 miles of stream. In addition to the 7 miles unsuitable for Bonneville (Utah) cutthroat trout habitat, 18.25 stream miles would remain in poor to fair condition.

Required inventory and assessment of prehistoric and historic resources that would be directly affected by the proposal (treatments and improvements) would provide immediate gains in scientific knowledge of the area and provide a data base for long-term gains.

If an inventory did not discover an existing site and it was subsequently destroyed during vegetation treatments or construction of improvements, there would be a long-term loss of data.

In the long term as the vegetation moves toward climax, visual resources would tend to become more natural; treatments would not be as noticeable.

Should livestock remain on private farmland longer in the spring or return earlier in the fall because of the range readiness turn-on date, hay production would be reduced. The livestock would trample meadows and harvest the hay before cutting. This situation would occur in the short term and extend throughout the long-term period as well.

In the short term, deer hunting opportunities would be increased as well as the establishment of a quality fisheries on 3 miles of stream. Sage grouse hunting opportunities would be reduced.

During the long term, deer hunting opportunities are expected to decline as a result of the overuse of key forage species. The quality fishery would continue and perhaps sage grouse hunting opportunities would increase as natural plant succession restored the sagebrush composition.

In both the short and long term, the losses of net income to all scales of operation could cause some small and medium operators to sell out to the larger operators who have greater operating efficiencies with less cost per marketable pound of beef. The adjustments in utilization, management restrictions, and vegetation treatments in the short term would result in no appreciable increase in forage production, stocking rates, or ranch income in the long term.

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CHAPTER 7

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

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IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

This chapter identifies the irreversible and irretrievable commitment of resources resulting from the proposed action. The term irreversible is defined as use that is incapable of being reversed: once something is initiated, it would continue. The term irretrievable means irrecoverable: once something is used, it is not replaceable.

Commitment of human resources to implement this proposal would be irreversible and irretrievable. Moneys, fuel, and materials used to fully develop the proposal are considered to be irretrievable.

Any archaeological, historical, or cultural values that may be inadvertently destroyed as a result of the proposed action are also considered irretrievable. Because development of the soil resource has occurred over hundreds of years, the additional erosion on 390 acres of soils are considered to be irretrievable.

Except as noted above, all other resources involved in the proposal are retrievable and/or reversible. These include such resources as livestock, wildlife, vegetation, and water quality, providing the wildlife or fisheries habitats are not irreversibly altered. The possibility of an irreversible loss of habitat for the Bonneville (Utah) cutthroat trout would occur.

The major irretrievable commitments would involve the loss of hunting opportunities as a result of sage grouse and deer habitat losses and those livestock operator losses associated with the installation, maintenance, and administration of the proposal. Once the expenditures and manpower allocations are made, those particular resources would not be available for other alternative programs. Irretrievable losses of income to the livestock operator would occur as a result of management actions that reduce livestock numbers, rest seedings, or vary the turn-on date.

CHAPTER 8

ALTERNATIVES TO THE PROPOSED ACTION

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ALTERNATIVES TO THE PROPOSED ACTION

INTRODUCTION

The following five alternatives to the proposed action are addressed in this chapter:

1. Elimination of all livestock grazing on public land
2. Restricted livestock use (utilization ceiling, no spring grazing, riparian habitat protection)
3. Reduction of adverse impacts to the proposed action
4. No action (continuation of present management)
5. Increased livestock grazing (vegetation treatments)

Each alternative addresses different levels of forage allocation to livestock and wildlife as shown below:

Alternative	Long Term Forage Allocation (AUMs) Livestock	Deer
Elimination of grazing	0	40,508
Restricted livestock use	12,809	36,782
Reducton of adverse impacts	22,808	16,119
No action	22,187	27,482
Increased livestock grazing	28,511	8,988

The extent of range development and vegetation treatment varies among alternatives. The manner and condition upon which livestock grazing would be allowed would also vary as well as the range management objectives for each alternative. Objectives range from maintenance to maximum protection and improvement of existing resource conditions.

The alternatives were selected to provide a broad range of management options. They vary from complete elimination of grazing to high-intensity management which would be achieved through additional developments for livestock forage production.

The following discussions describe each alternative and its impacts by resource. A summary is also provided at the end of this chapter which compares the impacts of each alternative with those of other alternatives, as well as with the proposed action. The basis for analysis of impacts is the existing environment discussed in Chapter 2. Impact analysis timeframe for each alternative was considered to be 20 years.

ALTERNATIVE 1 - ELIMINATION OF ALL LIVESTOCK GRAZING

DESCRIPTION

This alternative would eliminate domestic livestock grazing from 140,298 acres of public lands in Rich County. The purpose of this alternative would be to provide fast recovery to existing vegetation and wildlife-related resources in the Randolph ES area. To achieve complete elimination, State and private lands within or adjacent to existing allotments would have to be fenced to exclude livestock from public land. Because private and State lands are mixed throughout the ES area (only 30 percent of the ES area is public land) extensive fencing would be necessary to control livestock trespass on public lands. It would take approximately 670 miles of fencing to separate the public lands from the roughly 107,000 acres of intermingled private and State lands. The magnitude of this effort can be envisioned by review of the land ownership map inserted inside the back cover of this volume. Construction and maintenance costs would be incurred by all adjacent land owners. Range use supervision would be limited to control of livestock trespass in accordance with Federal regulations (43 CFR-9230). Management would be directed toward basic soil and vegetation resource protection and would not use livestock grazing as a means of accomplishing specific objectives.

No range developments would be completed. Only developments concerned with resource protection (such as check dams), or resource enhancement (such as wildlife habitat improvement), would be allowed. No new AMPs would be implemented, and all existing AMPs and grazing systems would be terminated. All vegetation would be available for wildlife, watershed protection, and recreation use. Proposed deer forage allocation would be 40,508 AUMs.

Within 5 years after implementation, there would be disposal of 2,611 acres of public land as well as the development of two proposed recreation sites totaling 7 acres. For allotments and acreage involved, see Appendix 2, table 1.

IMPACT ANALYSIS

Impacts to Soils

Elimination of grazing would reduce erosion on 41,046 acres of land as a result of increasing plant cover during the summer rainstorm period, increasing ground litter, and halting the effects of livestock trampling. Erosion impacts would be reduced in allotments indicated in table 8-1. These allotments presently receive about 60 percent utilization of key forage species and have a downward erosion trend.

Riparian areas would also be subject to less erosion. This results from the fact that these areas are normally utilized at a high intensity regardless ofthe level of use.

Significant change in erosion would not be anticipated on 96,634 acres since the present grazing use is at a moderate or lower intensity and is not considered to be a major cause of erosion. Proposed recreation sites and land disposals totaling 2,618 acres would have unknown erosion impacts.

This alternative would improve erosion on 2,050 acres presently in critical erosion condition (table 2-4) as a result of reducing the level of grazing intensity.

Within the New Canyon Allotment, 1,777 acres of land in critical erosion condition would not experience a significant change since the present level of grazing use is not believed to be causing erosion and the allotment is in fair erosion condition.

Soil stability on 33.75 miles of riparian areas would improve primarily from increased bank cover. Existing downward erosion trends would be halted in the Big Creek, Deseret, Duck Creek, Eastman, and South Woodruff Allotments as a result of eliminating livestock use on allotments in poor erosion conditin or those presently experiencing a heavy grazing intensity. Anticipated impacts to soil erosion are shown on table 8-1.

TABLE 8-1

Alternative 1: Erosion Projection

Allotment	Present Erosion Condition	Acres		
		Less Erosion	No Change	Unknown Impacts[a]
Bear Lake	Fair	......	1,118	80
Big Creek	Fair	20,025	......	321
Deseret	Poor	......	15,367	190
Dry Basin	Good	......	2,781	......
Duck Creek	Fair	13,250	......	160
Eastman	Poor	3,325	......	80
East Woodruff	Fair	......	2,167	......
Kearl	Good	......	1,183	......
Laketown	Good	93	3,148	......
Meachum Canyon	Poor	24	1,927	......
Middle Ridge	Good	......	......	1,286
New Canyon	Fair	......	30,447	218
Rabbit Creek	Good	......	3,257	......
Sage Creek	Good	25	10,103	25
Session	Fair	......	......	238
South Woodruff	Poor	4,251	......	......
Stuart	Good	......	1,042	......
Twin Peaks	Good	35	2,257	......
Woodruff Pastures	Fair	18	21,837	20
TOTALS		41,046	96,634	2,618

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[a] Unknown impacts to soil erosion would occur on these acres proposed for land disposal and recreation site development.

Conclusion

This alternative would reduce erosion on 41,046 acres of public land. Erosion on 96,634 acres would remain unchanged and erosion impacts on 2,618 acres (disposals) would be unknown.

Impacts to Vegetation

The elimination of livestock grazing would cause improvements to certain vegetation categories within the timeframe of this analysis (20 years). The vigor of desirable forage species, mainly grasses, would improve from poor or fair to good. Mueggler (1975) found that poor vigor bluebunch wheatgrass plants would recover to normal levels of vigor if protected from clipping for a period of 6 to 8 years.

Livestock forage production would increase by an estimated 5 percent under protection from grazing. Lang and Barnes (1942 as abstracted in Hickey, 1966) found that mid grasses and annual forbs yielded significantly higher when deferred from clipping during the growing season compared to clipping during the growing season. Mueggler (1975) found that with 10 years of protection from clipping, low vigor bluebunch wheatgrass plants increased seedstalk and herbage production to the levels of unclipped plants.

With the increase in vigor and plant production, there would be increased litter and apparent trend would improve. Since the production of livestock forage species (mainly grasses) would increase, their relative composition should also increase slightly.

Utilization of key species would be greatly reduced by the elimination of livestock grazing. It would not, however, be reduced to zero, since considerable wildlife use (an estimated 20 percent) would still occur on the vegetation.

Livestock forage condition is not expected to improve enough to change condition class (good, fair, poor). It would show a very slight improvement due to the small increase in grass composition. As pointed out in McLean and Tisdale (1972), very slow rates of recovery are expected. This is especially true on poor condition sites where complete protection from grazing for 20 years yielded little improvement.

For specific values of the various vegetation resource categories, refer to table 8-2.

Conclusion

Under this alternative, conditions would generally improve. Livestock forage condition, however, would be relatively unchanged. There would be 51,832 acres in good livestock forage condition, 67,223 acres fair, 6,549 acres poor, and 2,618 acres unknown (disposal and recreation sites). Livestock forage production would remain constant at 22,772 AUMs, although no livestock use would be allowed.

Impacts to Surface Water Quality

The elimination of livestock grazing would increase existing plant cover on all allotments, thereby reducing current runoff and sediment in streams and reservoirs within the Randolph ES area. Condition of riparian vegetation would improve on 33.75 miles, reducing streambank sloughing and improving water quality. Existing poor quality on 1.75 miles in Middle Ridge Allotment would continue.

Conclusion

Existing water quality conditions would be improved due to increased vegetation cover in the following allotments:

- Bear Lake
- Big Creek
- Deseret
- Dry Basin
- Duck Creek
- Eastman
- Laketown
- Kearl
- Meachum Canyon
- New Canyon
- Rabbit Creek
- Sage Creek
- South Woodruff
- Twin Peaks
- Woodruff Pastures

Impacts to Wildlife

Excluding livestock grazing from public lands would eliminate all existing conflicts between wildlife and livestock for space, cover, water, and forage. All wildlife forage currently consumed by livestock would immediately become available for wildlife (but may not be fully utilized), as would future AUMs available from improving forage condition. This would provide wildlife with 40,508 quality AUMs. Habitat degradation from existing livestock overgrazing would cease and forage quality should begin improving following livestock elimination, although

TABLE 8-2

Alternative 1: Summary of Impacts to Vegetation

	Livestock Forage Condition (acres)	Apparent Trend (acres)	Desirable Plant Vigor	Percent Utilization of Key Species	Composition and Density (acreage)	AUMs Livestock Forage Production
EXISTING						
All allotments 140,298 acres	Good 52,246 Fair 68,872 Poor 7,104 Unsuitable 12,076	Up 10,524 Static 75,811 Down 41,887 Unsuitable 12,076	Good on three allotments (6,478 acres) Laketown, Meachum Canyon, Middle Ridge Fair on 14 allotments (112,432 acres) Bear Lake, Deseret, Dry Basin, Duck Creek, Eastman, East Woodruff, Kearl, New Canyon, Rabbit Creek, Sage Creek, Session, South Woodruff, Twin Peaks, Woodruff Pastures Poor on two allotments (21,388 acres) Big Creek, Stuart	Values by allotment range from 12 to 74 percent	Density 37 Grass 24 Forb 11 Shrub 65	22,772
ALTERNATIVE 1						
All allotments (17) 137,680 acres	Good 51,832 Fair 67,223 Poor 6,549 Unsuitable 12,076	Up 84,153 Static 41,451 Down 0 Unsuitable 12,076	Good on all 17 allotments (137,680 acres) Bear Lake, Big Creek, Deseret, Dry Basin, Duck Creek, Eastman, East Woodruff, Kearl, Laketown, Meachum Canyon, New Canyon, Rabbit Creek, Sage Creek, South Woodruff, Stuart, Twin Peaks, Woodruff Pastures	All allotments an estimated 20 percent	Density 37 Grass 28 Forb 11 Shrub 61	22,311
Land disposals and recreation sites 2,618 acres[a]	Good 414 Fair 1,649 Poor 555 Unsuitable 0	Up 1,385 Static 797 Down 436 Unsuitable 0	Good on one allotment (1,286 acres) Middle Ridge Fair on Session Allotment and parts of nine others totaling 1,011 acres Poor on part of one allotment and 321 acres	All acres an estimated 20 percent	Density 37 Grass 28 Forb 11	461

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[a] Present resource conditions would prevail until disposal and recreation site development occur; then impacts would be unknown.

full recovery would be slow. This would be most noticeable in the critical deer winter ranges and the riparian and meadow areas which have suffered the most from livestock overgrazing and concentration.

There would be adequate quality forage available (40,508 AUMs) to meet existing deer needs (8,513 AUMs). Future forage demands (15,586 AUMs) would be satisfied on all but four allotments where the future demand estimate exceeds deer forage availability by 531 AUMs. Though sufficient high quality forage would exist on all allotments to accommodate significant expansion of the deer herds, the continued shortage of quality forage in Woodruff Pastures (59 percent of the critical deer winter range) would limit herd expansion to UDWR levels. Table 8-3 identifies forage availability, demand, and shortages for each allotment.

Improvements in the meadow and riparian habitats would provide the sage grouse populations with major opportunities to increase in size and distribution.

More diversity would eventually develop among the vegetation associations. This improved diversity would provide more plentiful and varied habitat and feed for small mammals, raptors, avifauna, big game, and carnivores and their populations should increase proportionately.

Land disposal would result in loss of management control on 2,611 acres of wildlife habitat. Forage resources (527 AUMs) and 1.75 miles of riparian habitat would be involved. Proposed antelope AUM allocations would be available in all allotments East Woodruff (20 AUMs). This should not limit the size of the antelope introduction as sufficient forage exists in the other allotments to take care of the shortage.

Conclusion

This alternative would improve existing wildlife habitat conditions. The 14,856 acres of critical deer winter range currently in poor condition would improve to at least fair condition. The nine sage grouse complexes currently in poor condition would improve to good. Available forage would be of higher quality and would be sufficient to meet future demand estimates (only 531 AUMs shortage would occur).

TABLE 8-3

Alternative 1: Future Deer Forage Availability and Demand

	AUMs					
	Seasonal Deer Range			Critical Deer Winter Range		
Allotment	Available	Demand	Shortfall	Available	Demand	Shortfall
Bear Lake	.....	.....	.....	450	217	.....
Big Creek	5,818	1,646	.....	793	227	.....
Deseret	.....	.....	.....	3,224	68	.....
Dry Basin	1,181	564	.....	.....	.....	.....
Duck Creek	4,985	678	.....	.....	.....	.....
Eastman	978	330	.....	439	150	.....
East Woodruff	371	518	147	.....	.....	.....
Kearl	669	235	.....	.....	.....	.....
Laketown	512	188	.....	492	184	.....
Meachum Canyon	383	186	.....	135	67	.....
Middle Ridge	.....	251	251	.....	.....	.....
New Canyon	8,077	2,622	.....	.....	.....	.....
Rabbit Creek	1,226	395	.....	.....	.....	.....
Sage Creek	3,463	1,254	.....	.....	.....	.....
Session	.....	40	40	.....	.....	.....
South Woodruff	377	414	37	590	646	56
Stuart	296	.....	.....	296	255	.....
Twin Peaks	829	461	.....	.....	.....	.....
Woodruff Pastures	1,371	1,286	.....	2,914	2,704	.....
TOTALS	30,536	11,068	475	9,972	4,518	56

NOTE: Forage availability (increased due to livestock exclusion) exceeds demand in most cases. Future demands may be limited by other factors such as space and water.

Impacts to Fishery Habitat

Since this alternative eliminates livestock use on public lands, the aquatic/riparian zones along the 33.75 stream miles in the ES area would be enhanced and improved significantly. Land disposals would result in loss of management control on 1.75 miles of riparian habitat on Middle Ridge Allotment. This habitat would probably remain in poor condition. Existing poor condition habitats would be improved to at least good condition for fisheries. Exclusion of livestock in riparian zones would improve cover of riparian vegetation along streambanks and streambank stability (Duff, 1978). Exceptions would occur where livestock use continues on private lands upstream from public lands, thereby impacting those aquatic habitats through siltation/sedimentation of streambottom gravels, causing deteriorating pool and water quality conditions.

Conclusion

Exclusion of livestock grazing would result in the following long-term impacts to fisheries habitat condition: riparian habitat condition would improve (especially streambank cover) on 33.75 miles; 13 miles (out of the total 33.75 miles) would improve to excellent condition, 4 miles would improve to good condition, and 16.75 miles would improve from poor to fair condition. Habitat improvement recovery would allow for reintroduction of the sensitive Bonneville (Utah) cutthroat trout into 14.75 miles of six streams.

Impacts to Archaeological and Historical Values

Any livestock-related, surface-disturbing activities which currently damage archaeological and historical resource sites would be reduced to insignificance because livestock trampling would not directly damage sites, and damage caused by continued erosion (due to livestock grazing) would be reduced.

Impacts to Visual Resources

Improvement in vegetation diversity and vigor along streambanks due to elimination of livestock use would noticeably improve scenic quality.

Impacts to Recreation

Recreational resources would also be influenced by elimination of livestock grazing. Aquatic/riparian habitat improvement would occur rapidly. This habitat type should be as productive as possible, supplying high quality sport fishing, wildlife viewing, and hunting opportunities.

Sport hunting and wildlife viewing opportunities unitwide would improve. Livestock competition with wildlife would be eliminated and recreational values would be enhanced.

Both developed and undeveloped camping sites would improve in quality and availability as more areas become suitable and desirable for camping activities. Visitors who place a high value on observing livestock grazing in a pastoral setting would have opportunities provided from adjacent and often intermingled private land (see land ownership map, inside back cover). Access restrictions on private land may further limit access to users of public land.

Impacts to Natural Values

Natural values would improve unitwide. Elimination of livestock grazing would strongly complement management for scenic and natural values in the proposed Laketown Canyon ACEC.

Impacts to Rancher Incomes

The primary effect of this alternative would be elimination of that portion of each rancher's income which is derived from grazing on public lands. For the purpose of analysis, the assumption has been made that the rancher would be unable to obtain economical alternative feed sources (e.g. the purchase of hay) for the AUMs lost and that he would be forced to cut back his herd by an amount equivalent to his proportionate seasonal dependence on BLM. This approach yields a "worst case" analysis. The effects of elimination of livestock grazing from BLM lands are shown in table 8-4.

As can be seen, elimination would make it unprofitable (or more unprofitable, in the case of the medium scale ranchers) for the small and medium scale operators to remain in the livestock business even

TABLE 8-4

Alternative 1: Economic Effects of Elimination of Livestock Grazing

	Small Scale		Medium Scale		Large Scale	
	Existing Situation	With Elimination	Existing Situation	With Elimination	Existing Situation	With Elimination
Average number head	65	38	283	215	536	354
AUMs	1,022	593	3,530	2,683	7,637	5,040
Average gross income	$9,218.00	$ 5,346.00	$36,667.00	$27,867.00	$109,818.00	$ 72,480.00
Average fixed costs[a]	4,998.00	4,998.00	23,816.00	23,816.00	48,820.00	48,820.00
Average variable costs	2,793.00	1,620.00	23,764.00	18,061.00	17,768.00	11,727.00
Average net income	1,427.00	(-1,272.00)	(-10,903.00)	(-14,010.00)	43,230.00	11,933.00
Net income per AUM	1.40	(-2.15)	(-3.09)	(-5.22)	5.66	2.37
Break-even point[b]	$7,171.00	$7,171.00	$67,645.00	$67,681.00	$58,243.00	$58,243.00
Seasonal dependence (percent)	42	....	24	....	34	....
Potential capital[c] value loss	....	$21,703.00	....	$42,850.00	....	$131,382.00

Source: Tables 2-22 and 2-23.

[a] Fixed costs are assumed not to change.
[b] Differences in break-even points due to rounding procedures.
[c] Based upon maximum sales value per AUM of $50.59. See Appendix 15.

though their entire operations would not be affected. Net income and net income per AUM would both become negative for these two classes. The large scale operator's profit margin is currently large enough so that a cut of 34 percent of his operation (the seasonal dependence level) would result in an approximate 58 percent reduction in his net income per AUM, but still leave him with a profit. Based upon a maximum capital value per AUM of $50.59, the potential sale value of all three ranch scales would be severely affected. This would have a compounding negative impact on those individuals already being forced out of business by existing economic conditions.

By multiplying the average potential gross income loss for each scale of ranch operation by the number of operations in each group, the following estimate of direct county income loss is obtained:

Small $ 3,872 x 37 = $143,264
Medium 8,800 x 33 = 290,400
Large $37,338 x 14 = 522,732
$956,396

Indirect losses would push this figure to over $1 million.

Impacts to Local Values and Attitudes

It is difficult to predict how this alternative would affect Rich County employment patterns. Although ranching tends to be quite labor intensive, it does not operate as a massive employer. Therefore, even though numerous individual operators would be threatened with loss, mass unemployment would not be anticipated.

This alternative would impact the traditional socio/cultural values of the residents in Rich County. Attitudes would be expected to be hostile. Logically, those most directly affected, the 84 BLM livestock permittees, would perceive this as an adverse impact to their livestock-oriented lifestyle. Rural values important to these individuals and their families would be jeopardized.

Conclusion

The actual severity incurred by individual operators would depend on their respective overall dependencies on BLM grazing during their normal seasons of use. It is not possible to accurately predict exact numbers, but many operators, especially of the small and medium size classes, would probably forced out of the industry if this aternative were to be implemented.

ALTERNATIVE 2 - RESTRICTED LIVESTOCK FORAGE USE (Utilization Ceiling, No Spring Grazing, Riparian Habitat Protection)

DESCRIPTION

This alternative would restrict livestock utilization of forage to a maximum of 30 percent of the current annual growth of desirable forage species. The purpose would be to allow for continuous low-level livestock grazing after on all allotments after forage plants have reached maturity. The goal of this alternative would be to sustain existing forage production and provide for rapid improvement of the existing vegetation resources.

In addition, the proposed level of livestock use would be restricted in the following ways:

1. Livestock turn-on date would be 7/15 (when forage plants reach maturity) for all allotments. Turn-off dates would be similar to those proposed in Chapter 1 except for Big Creek, Meachum Canyon, and Woodruff Pastures Allotments where turn-off would be October 31.

2. There would be no vegetation treatments proposed. Allotment-wide grazing would be proposed for all but East Woodruff, Twin Peaks, and Meachum Canyon Allotments having existing grazing systems (Chapter 1).

3. Complete exclusion of livestock use by protective fencing of 33.25 miles of stream would be required in addition to the 0.5 mile already fenced in the Big Creek exclosure. A maximum of 66 miles of fence would be needed at a cost of approximately $99,000. No additional range developments are proposed.

The residual amount of forage made available by these restrictions (an estimated 9,500 AUMs) would be allocated to help fulfill existing and future wildlife needs (approximately 3,700 AUMs would be usable by deer) and to provide for soil protection.

This alternative would be implemented upon completion of the Final Environmental Statement and subsequent range management decisions.

Livestock utilization, forage condition, and trend monitoring would be required. Range administration and supervision would be the same as proposed in Chapter 1. Range management objectives would be aimed at maintenance and protection of existing values.

Disposal of 2,618 acres of public land and development of 7 acres of recreation sites as proposed in Chapter 1 would be allowed. Appendix 1 indicates specific allotments involved.

Proposed forage allocation would be 12,809 AUMs for livestock and 36,782 AUMs for deer. Table 8-5 identifies the allocation for each allotment.

IMPACT ANALYSIS

Impacts to Soil Erosion

Fencing riparian areas and reducing grazing to a light (30 percent) intensity would reduce erosion on 41,047 acres as a result of increased plant cover during the summer rainstorm period, increased ground litter, and reducing the effects of livestock trampling. Erosion would be reduced on allotments indicated in table 8-6. These allotments presently receive about 60 percent use of the key forage species and have a downward erosion trend. No significant change in erosion rates would occur on 96,555 acres, since present grazing use on these acres is not believed to be causing erosion. Erosion rates on 78 acres would increase as a result of land disturbance associated with the proposed range developments. The proposed land disposals and recreation site developments (2,618 acres) would have unknown impacts.

Livestock impacts to erosion would be reduced within the Eastman, and South Woodruff Allotments due to reductions in the intensity of use. Currently, these allotments contain 1,459 acres in critical erosion condition (table 2-4). No significant change would occur to the critical erosion areas within the Deseret and New Canyon Allotments (2,368 acres).

TABLE 8-5

Alternative 2: Proposed AUM Forage Allocations

Allotment	Livestock	Deer Seasonal Range		Critical Deer Winter Range		Antelope	Aquatic/ Riparia
		Existing	Future	Existing	Future		
Bear Lake	85	0	0	184	217	0	0
Big Creek	1,715	969	1,646	125	227	0	76
Deseret	2,427	0	0	31	68	140	0
Dry Basin	471	134	564	0	0	0	0
Duck Creek	742	522	678	0	0	29	133
Eastman	353	156	330	68	150	80	0
East Woodruff	175	125	518	0	0	20	0
Kearl	280	55	235	0	0	0	0
Laketown	135	112	188	117	184	0	64
Meachum Canyon	252	87	186	30	67	0	12
Middle Ridge	0	0	0	0	0	0	0
New Canyon	2,329	1,556	2,622	0	0	0	178
Rabbit Creek	392	156	395	0	0	3	0
Sage Creek	596	388	1,254	0	0	100	13
Session	0	0	0	0	0	0	0
South Woodruff	137	190	414	297	646	0	12
Stuart	56	0	0	115	255	0	0
Twin Peaks	271	87	461	0	0	0	0
Woodruff Pastures	2,393	1,007	1,286	1,222	2,704	0	9
TOTAL	12,809	5,544	10,777	2,189	4,518	372	497

TABLE 8-6

Alternative 2: Erosion Projection

Allotment	Present Erosion Condition	Acres			
		Erosion			Unknown Impacts[a]
		Less	No Change	More	
Bear Lake	Fair	......	1,118	......	80
Big Creek	Fair	20,013	......	12	321
Deseret	Poor	......	15,367	......	190
Dry Basin	Good	......	2,781	......	......
Duck Creek	Fair	13,232	......	18	160
Eastman	Poor	3,325	......	......	80
East Woodruff	Fair	......	2,167	......	......
Kearl	Good	......	1,183	......	......
Laketown	Good	93	3,141	7	......
Meachum Canyon	Poor	24	1,925	2	......
Middle Ridge	Good	......	......	......	1,286
New Canyon	Fair	......	30,419	28	218
Rabbit Creek	Good	33	3,221	3	......
Sage Creek	Good	25	10,101	2	25
Session	Fair	......	......	......	238
South Woodruff	Poor	4,249	......	2	......
Stuart	Good	......	1,042	......	......
Twin Peaks	Good	35	2,254	3	......
Woodruff Pastures	Fair	18	21,836	1	20
TOTAL		41,047	96,555	78	2,618

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[a] Unknown impacts to soil erosion would occur on these acres proposed for land disposal and recreation site development.

Riparian areas (33.75 miles) would improve vegetation cover and streambanks would stabilize. Existing streambank sloughing problems in these areas would be eliminated.

Downward trends (table 2-5) would be halted in the Stuart, Big Creek, and Woodruff Pastures Allotments. No significant change would occur to the Rabbit Creek Allotment.

Table 8-6 provides a summary of the anticipated erosion impacts by allotment.

Conclusion

Implementation of this alternative would reduce erosion on 41,047 acres, increase erosion on 78 acres, and leave 96,555 acres unchanged. Unknown impacts would occur to 2,618 acres of land.

Impacts to Vegetation

Restricting livestock forage use would result in positive impacts to several vegetation resource categories. The extent of this reduction is shown on table 8-7. The seed-ripe turn-on date proposed (estimated to be 7/15) has been stated as being beneficial. Hickey (1966) found, "The fastest way to improve deteriorated range having sufficient cover for natural reseeding is through complete growing season deferment." Craddock and Forsling (1938 as abstracted in Hickey, 1966), in their studies on big sagebrush - bunchgrass ranges in southern Idaho, produced the recommendation that " . . . deferring all grazing until fall for a period of several years on successive portions of the range is recommended for obtaining maximum improvement of depleted range."

Protection from grazing until seed ripe should cause an improvement in the vigor of desirable species. Douglas (1915 as abstracted in Hickey, 1966) found that the vigor of plants after 2 or 3 years of grazing only after seed maturity was little different from the vigor of the same species protected from grazing. However, there was a marked difference in the vigor of species either grazed after seed maturity or not grazed at all, and the vigor of the same species grazed year after year during the growing season.

TABLE 8-7

Alternative 2: Livestock Forage Use

Allotment	Existing Forage Use - Total Livestock AUMs	Proposed Forage Use Total Livestock AUMs This Alternative	Adjustment in Use - Percent Reduction
Bear Lake	168	85	49
Big Creek	3,880	1,715	56
Deseret	2,427	2,427	0
Dry Basin	471	471	0
Duck Creek	1,925	742	61
Eastman	648	353	46
East Woodruff	175	175	0
Kearl	504	280	44
Laketown	299	135	55
Meachum Canyon	264	252	4
Middle Ridge[a]	103	0	100
New Canyon	4,930	2,329	53
Rabbit Creek	484	392	19
Sage Creek	1,036	596	42
Session[a]	40	0	100
South Woodruff	367	137	63
Stuart	102	56	45
Twin Peaks	271	271	0
Woodruff Pastures	4,804	2,393	50
TOTALS	22,898	12,809	

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[a] Disposal of these two allotments would be proposed. Until disposal occurs, 84 AUMs on Middle Ridge and 24 AUMs on Session would be available. Long-term reductions would be 100 percent of existing use upon full implementation.

Livestock forage production should increase by an estimated 3 percent under growing season deferment from grazing. Lang and Barnes (1942 as abstracted in Hickey, 1966) found that mid grasses and annual forbs yielded significantly higher when deferred from clipping during the growing season than when clipped during the growing season. No increase is expected on two allotments proposed for disposal.

Increases in vigor, plant production, and subsequent increases in litter, would improve apparent trend values on 12 allotments. These allotments would have lower utilization rates than at present. Apparent trend values would remain at present levels on five allotments because of no change in utilization. Trend would remain the same on two allotments proposed for disposal.

The relative composition of grasses should increase due to the increased production. The increase would, however, be very small. No increase is expected on the two disposal allotments.

The utilization of key species, measured at the time livestock leave the range, would remain at present levels (30 percent or less) on five allotments, and go down to 30 percent on 12 allotments. It would remain the same on the two allotments for disposal. Total utilization, however, may be as high as 50 percent on the key forage species due to the wildlife use which would occur after livestock leave the range.

Livestock forage condition may show a very slight improvement due to the increased grass composition, but it would not increase enough to change condition class. No change is expected on the two allotments for disposal.

On 1,031 acres of fenced riparian vegetation, the following would occur:

1. Woody streamside vegetation (willows and alders) would increase.
2. Herbaceous vegetation would increase in density and vigor would improve. Forage and cover for wildlife would increase.
3. Utilization of key species would decline.
4. Apparent trend would be up.

5. Livestock forage production would increase; however, the quantity of forage available to livestock would decrease. For specific values, refer to table 8-8.

Conclusion

This alternative would allow for some improvement to vegetation conditions, although livestock forage condition would be relatively unchanged. There would be 51,832 acres in good livestock forage condition, 67,123 acres fair, 6,549 acres poor, and 2,618 acres unknown.

Impacts to Surface Water Quality

This alternative would improve water quality in the Randolph ES area. There would be a slight increase in cover and production, thereby decreasing runoff and sediment. This would, in turn, improve water quality.

Exclusion of livestock from an additional 33.25 miles (0.5 mile exclusion already exists on Big Creek) of stream would allow riparian vegetation to improve. This would reduce or eliminate streambank sloughing and improve water quality in these areas, although grazing upstream on adjacent watersheds would result in some continued sedimentation into fenced stream areas.

Conclusion

Existing water quality of streams (33.75 miles) within the following allotments would improve:

Big Creek
Duck Creek
Laketown
Meachum Canyon
New Canyon
Rabbit Creek
Sage Creek
South Woodruff
Twin Peaks
Woodruff Pastures

Impacts to Wildlife

The adjustments in grazing levels and seasons of use outlined by this alternative would produce improvements in wildlife habitat.

The July 15 turn-on date would eliminate most of the current forage and spatial competition between livestock and young sage grouse. Livestock would not enter the range until near the end of the competition

TABLE 8-8

Alternative 2: Summary of Impacts to Vegetation

Allotments	Livestock Forage Condition (acres)		Apparent Trend (acres)		Desirable Plant Vigor	Percent Utilization of Key Species	Composition and Density	
EXISTING								
All allotments 140,298 acres	Good Fair Poor Unsuitable	52,246 68,872 7,104 12,076	Up Static Down Unsuitable	10,524 75,811 41,887 12,076	Good on three allotment (6,478 acres) Lake town, Meachum Canyon, Middle Ridge Fair on 14 allotments (112,432 acres) Bear Lake, Deseret, Dry Basin, Duck Creek, Eastman, East Woodruff, Kearl, New Canyon, Rabbit Creek, Sage Creek, Session, South Woodruff, Twin Peaks, Woodruff Pastures Poor on two allotments (21,388 acres) Big Creek, Stuart	Values by allotment range from 12 to 74 percent	Density Grass Forb Shrub	37 24 11 65
ALTERNATIVE 2								
Deseret, Dry Basin, East Woodruff, Twin Peaks, Meachum Canyon (24,558 acres)	Good Fair Poor Unsuitable	12,955 10,269 0 1,334	Up Static Down Unsuitable	2,878 18,669 1,677 1,334	Good on one allotment (1,951 acres) Meachum Canyon Fair on four allotments (22,607 acres) Deseret, Dry Basin, East Woodruff, Twin Peaks	22	Density Grass Forb Shrub	37 24 11 65
Bear Lake, Big Creek, Duck Creek, Eastman, Kearl, Laketown, New Canyon, Rabbit Creek, Sage Creek, South Woodruff, Stuart, Woodruff Pastures (113,122 acres)	Good Fair Poor Unsuitable	38,877 56,854 6,549 10,742	Up Static Down Unsuitable	62,606 39,774 0 10,742	Good on 10 allotments (92,055 acres) Bear Lake, Duck Creek, Eastman, Kearl, Laketown, New Canyon, Rabbit Creek, Sage Creek, South Woodruff, Woodruff Pastures Fair on two allotments (21,067 acres) Big Creek, Stuart	30	Density Grass Forb Shrub	37 26 11 63
Land disposals and recreation sites 2,618 acres	Good Fair Poor Unsuitable	414 1,649 555 0	Up Static Down Unsuitable	1,385 797 436 0	Good on Middle Ridge Allotment (1,286 acres) Fair on Session and parts of nine other allotments totaling 1,011 acres Poor on part of one allotment and 321 acres	21	Density Grass Forb Shrub	37 24 11 65

period. The remaining levels of competition would be minor as the young sage grouse would soon be shifting to a diet with little livestock overlap. Sage grouse populations should begin to increase.

Removing livestock by 10/31 on all critical deer winter ranges would reduce fall forage competition with the deer and eliminate the late fall and early winter competition, providing deer with more forage during the winter months on 6,883 acres of critical deer winter range.

In Woodruff Pastures Allotment, 9,917 acres of critical deer winter range would remain in poor condition from the absence of quality deer forage. The predicted future expansion of deer herds would create forage shortages and overgrazing and the subsequent decline of the deer numbers would result.

Limiting livestock use to 30 percent would increase forage available for deer use. However, the proposed deer forage allocation of 36,782 AUMs would not be totally available because forage was included which would not be used by the deer. When dietary overlap is figured, approximately 12,142 AUMs would be available (8,435 AUMs of existing forage and 3,702 AUMs of additional forage made available from the 30 percent restriction in livestock use). This forage is high quality, containing adequate amounts of preferred species and would be sufficient to meet existing deer needs and 69 percent of the future forage requirements. Future deer forage shortages and their distributions are summarized on table 8-9.

Total exclusion of livestock on 33.75 miles of aquatic/riparian habitat would allow 993 acres of riparian habitat to improve to excellent condition, providing major increases in forage quality and habitat diversity for all major nongame wildlife species, since all existing and future AUMs from riparian habitat improvements would be available for wildlife. These populations should improve in diversity and size.

Land disposals would result in loss of management opportunities on 1.75 stream miles of riparian habitat and 2,611 acres of seasonal deer ranges. There would be a total seasonal deer forage loss of 527 AUMs. Proposed antelope AUM allocations would only be available in Deseret and Duck Creek Allotments.

TABLE 8-9

Alternative 2: Future Deer Forage

Allotment	Seasonal Deer Range AUMs Available	Demand	Shortfall	Critical Deer Winter Range AUMs Available	Demand	Shortfall
Bear Lake	......	......	......	217	217	......
Big Creek	1,563	1,646	83	367	227	......
Deseret	......	......	......	738	68	0
Dry Basin	134	564	434	......	......	......
Duck Creek	942	678	......	......	......	......
Eastman	240	330	90	102	150	48
East Woodruff	125	518	393	......	......	......
Kearl	145	235	90	......	......	......
Laketown	140	188	48	129	184	55
Meachum Canyon	87	186	99	30	67	37
Middle Ridge	......	251	251	......	......	......
New Canyon	2,525	2,622	97	......	......	......
Rabbit Creek	193	395	202	......	......	......
Sage Creek	559	1,254	695	......	......	......
Session	......	40	40	......	......	......
South Woodruff	252	414	162	322	646	324
Stuart	......	......	......	133	255	122
Twin Peaks	87	461	374	......	......	......
Woodruff Pastures	1,611	1,286	......	1,501	2,704	1,203
TOTALS	8,603	11,068	3,058	3,539	4,518	1,789

Conclusion

Sage grouse populations would increase. Deer herds would increase, but not to UDWR desired levels. Nongame species would increase in diversity and numbers. Opportunities for antelope introduction would be severely limited.

Impacts to Fishery Habitat

This alternative would provide complete exclusion of livestock in aquatic/riparian zones on the total 33.75 stream miles on public lands. Aquatic habitat would be enhanced or improved significantly to a good to excellent condition. Streambank cover and bank stability would improve. Exceptions to this are the same as those discussed in Alternative 1 - continued sedimentation from livestock grazing on private lands upstream. Habitat improvement recovery would allow for reintroduction of the sensitive Bonneville (Utah) cutthroat trout into 14.75 miles of six streams.

The 1.75 miles of aquatic habitat on public land in Middle Ridge Allotment would be proposed for disposal. Resultant impacts to the 1.75 miles are unknown, but it is assumed that the two stream portions would be in poor to fair condition.

Exclusion of livestock grazing would result in 13 miles of fishing habitat in excellent condition, 4 miles in good condition, and 16.75 miles in fair condition. Riparian habitat condition would improve (especially streambank cover) on 33.75 miles.

Impacts to Archaeological and Historical Resources

Any existing damage to archaeological and historical resources associated with livestock use would be reduced since there would be less livestock trampling and a lower rate of erosion.

Impacts to Visual Resources

Vegetation cover and diversity should increase unitwide with management for 30 percent utilization of forage by livestock. Riparian zones should also improve as discussed in the Soils and Vegetation sections. Sightseeing opportunities would increase and the quality of the visual scene would improve as a result of more natural color and variety in the landscape.

Impacts to Recreation

Exclusion of livestock by protective fencing of 33.25 miles of riparian habitat (in addition to the 0.5 mile of existing Big Creek exclosure) would have positive impacts to fishing opportunities resulting from improved fish habitat condition and quality. Management for 30 percent forage utilization by livestock would increase ground cover and would increase species abundance and diversity. These impacts would enhance existing wildlife viewing, hunting, and camping opportunities in the Randolph ES area.

Impacts to Natural Values

Natural values would be enhanced. Management for natural and scenic values in the proposed Laketown Canyon ACEC would also be enhanced.

Impacts to Rancher Incomes

This alternative contains several elements which would yield negative impacts to the economic health of the livestock industry of Rich County. The delayed turn-on date would negatively affect hay production because livestock would remain on private hay meadows until turn-on. In addition, a total of 10,089 AUMs would be lost due to utilization restrictions, riparian exclosures, etc. When compared with the existing average active authorized use levels, this alternative would result in an average 52-percent reduction in grazing capacity for the small ranch, a 52-percent reduction for the medium scale, and a 48-percent reduction for the large scale ranch. These stocking level reductions are translated into budgetary terms, prorated by seasonal dependency percentages in table 8-10.

Direct gross income losses within the county are estimated by multiplying the average loss per scale by the number of operations within each scale to yield:

Small	$ 1,513	x	37	=	$ 55,981
Medium	4,576	x	33	=	151,008
Large	$17,992	x	14	=	250,908
					$457,897

Impacts to Local Values and Attitudes

Direct employment impacts are not anticipated to be of such magnitude as to disrupt the Rich County economy. It would be expected that the greatest financial pressure would be on the medium scale operations and that most employment changes would occur within this scale.

Attitudes of county residents would be in opposition. The individual BLM livestock permittees would be most directly affected. The restrictive utilization of livestock forage, coupled with disturbance to customary livestock management practices, would undoubtedly provide a feeling of more government controls and regulations. The concept of independence, traditionally shared by these individuals and their families, would be jeopardized. On the other hand, the attitudes of other users of public lands in Rich County, particularly those people deriving recreation-based experiences, may view this alternative with the attitude of support and feel the expression of their lifestyle and values has been enhanced.

Conclusions

This alternative has the potential of reducing grazing on BLM lands in the Randolph Planning Unit by a little over 50 percent. This would affect rancher incomes negatively, but probably not to the point of causing major economic disruption to the Rich County livestock industry. However, the most potentially crucial element of the alternative could be the turn-on date of July 15 which would impair hay production if the livestock must be held on private pasturage until that date. Without such hay production, many operations, regardless of size, would be jeopardized.

TABLE 8-10

Alternative 2: Economic Effects of Restricted Livestock Use

	Small Scale		Medium Scale		Large Scale	
	Existing Situation	With Alternative 2	Existing Situation	With Alternative 2	Existing Situation	With Alternative 2
Average number head	65	51	283	248	536	449
AUMs	1,022	799	3,530	3,089	7,637	6,390
Average gross income	$9,218.00	$7,705.00	$36,667.00	$32,091.00	$109,818.00	$91,896.00
Average fixed costs	4,998.00	4,998.00	23,816.00	23,816.00	48,820.00	48,820.00
Average variable costs	2,793.00	2,183.00	23,764.00	20,798.00	17,768.00	14,868.00
Average net income	1,427.00	348.00	(-10,903.00)	(-12,523.00)	43,230.00	28,208.00
Net income per AUM	1.40	0.44	(-3.09)	(-4.05)	5.66	4.41
Break-even point	$7,171.00	$7,171.00	$67,645.00	$67,676.00	$58,243.00	$58,243.00
Seasonal dependence (percent)	42	....	24	....	34	....

ALTERNATIVE 3 - REDUCTION OF ADVERSE IMPACTS TO THE PROPOSED ACTION

DESCRIPTION

Analysis of the proposed action indicates that specific changes in the proposal would reduce adverse impacts that would occur as a result of implementation of the proposed action. Public land acres where livestock grazing would be authorized, implementation schedule, grazing and resting treatments, level of wildlife and livestock use, and vegetation treatments would be modified by this alternative. The proposed long-term forage allocation would be 22,808 AUMs for livestock and 16,119 AUMs for deer.

Allotment boundaries are described in the proposed action. Except where specifically modified, land disposal, recreation site development, project design specifications, administration, management objectives, and range developments would be the same as proposed in Chapter 1. The modification of the proposed action includes five changes:

1. Exclude livestock use by fencing 16.5 miles of streams (in addition to the 0.5 mile fenced in the existing Big Creek exclosure). Livestock exclusion would include 448 acres of aquatic/riparian habitat, eliminating livestock grazing on all high-value streams having habitat suitable for reintroduction of Bonneville (Utah) cutthroat trout. Table 8-11 identifies stream portions and allotments involved.

A maximum of 33 miles of fence would be required at a cost of $49,500. Specific studies designed to monitor fisheries habitat improvement would also be initiated. This part of the alternative would be implemented immediately upon completion of the Final Environmental Statement and formulation of final range decisions. It would require adjustments in the initial stocking level for livestock as follows:

TABLE 8-11

Alternative 3: Proposed Livestock Exclusion on Select Aquatic/Riparian Habitats

		Proposed Exclusion Chapter 1		Additional This Alternative		Total This Alternative	
Creek[a]	Allotment	Miles	Acres	Miles	Acres	Miles	Acres
Laketown	Laketown	1.0	23	3.0	70	4.0	93
	Twin Peaks	1.25	29	0.25	6	1.5	35
Spring	New Canyon	0.25	20	0.25	10	0.5	30
Little	New Canyon	0.75	18	0.5	7	1.25	25
North Fork Otter	New Canyon	2.25	31	2.75	57	5.0	88
Middle Fork Otter	New Canyon	0.75	28	1.0	57	1.75	85
South Fork Otter	New Canyon	0	0	0.75	33	0.75	33
Randolph	Big Creek	1.75	59	0	0	1.75	59
TOTAL		8.0	208	8.5	248	16.5	448

[a] All creeks except Randolph contain habitat suitable for reintroduction of Bonneville (Utah) cutthroat trout.

Allotment	Public Land Acres Excluded	Livestock AUMs Reduced
Big Creek	59	59
Laketown	93	93
Twin Peaks	261	261
New Canyon	35	35
TOTAL	448	448

Livestock use would not be authorized on 2,611 acres of public land proposed for disposal in 10 allotments and 7 acres proposed for recreation site development (table 1, Appendix 20). Existing livestock AUMs would be reduced an additional 357 AUMs. Initial livestock use proposed would be 22,236 AUMs.

2. Delay the proposed implementation schedule for 3 years so wildlife and livestock actual forage use and utilization data can be obtained. Adjustments in livestock use would be delayed 3 years to accumulate these data and determine the proper initial level of livestock use which, together with deer use, would not exceed the maximum allowable use for competitive desirable forage species. Forage allocation would then be based on these data and allowances made for wildlife and livestock dietary overlap on key forage species. It is estimated the result of this study would be to restrict livestock utilization of key forage species to 40 percent. The following actions would be required to accomplish this on all allotments:

a. Initiate actual use studies by BLM immediately for existing levels of wildlife and livestock use. This would require increased range supervision.

b. Ear tag livestock as a means of verifying actual use data in relation to forage utilization. This would be required of all livestock entering allotments and would occur the first grazing season upon completion of the final ES and formulation of a range management decision by BLM.

c. Concurrently initiate forage utilization studies designed to measure the actual amount of forage consumed by livestock and wildlife.

d. Make adjustments to the existing level of livestock use to assure competitive forage species are available to deer at the time and amount needed.

Appendix 20 illustrates how this information would be used to determine initial wildlife and livestock forage allocations.

3. Modify the proposed season of use and grazing and resting treatments (Chapter 1) to reduce impacts to vegetation and wildlife. This modification would involve strict adherence to the range readiness principle and provide for early turn-on (estimated to be May 10) as well as allow for the possibility of turn-on later than June 1 if the phenological development of key species is delayed due to varying climatic conditions. This would apply to both initial and long-term actions and would begin upon implementation of this alternative during the 3-year study period prior to any adjustments in the level of livestock use. The alternative would also modify livestock turn-off dates on three allotments to October 31 (Big Creek, Meachum Canyon, Woodruff Pastures). Turn-off for other allotments would remain unchanged from the proposed action (Appendix 4). This modification would provide for early turn-off on all critical deer winter ranges.

The sequence of grazing and resting treatments in the long term would also be modified on adjacent allotments containing critical deer winter range so that critical deer winter range in each allotment would not be grazed at the same time. For example, the grazing treatment sequence on critical deer winter range in one allotment would begin in the spring and proceed through the summer-fall treatments; the sequence on critical deer winter range in an adjacent allotment would begin in the summer and proceed through the fall and spring (the following year) treatments. This modification would be made on the following allotments:

Bear Lake
Big Creek
Dry Basin
Duck Creek
East Woodruff
Kearl
Laketown
Meachum Canyon
New Canyon
Rabbit Creek
Sage Creek
Stuart
Twin Peaks
Woodruff Pastures

4. Reduce the acreage proposed for vegetation treatments to only those soils with a greater than 50 percent chance of seeding success and to accommodate critical sage grouse habitat, critical erosion areas, and critical deer habitat. The first phase of this alternative would be to initiate a cooperative research study to be conducted jointly by BLM and Utah Division of Wildlife Resources (UDWR) to identify and quantify important sage grouse seasonal use areas and breeding complexes. The results of this study would be used by BLM to identify areas for vegetation treatment, as well as the size, location, and type of treatment to be used in order to reduce impacts to sage grouse habitat (Chapter 3). It is anticipated the study would require the following:

On dry meadow areas in poor ecological condition (within a 2-mile radius of identified strutting grounds), vegetation treatments would be modified to provide a 150-feet buffer strip, thus leaving essential habitat undisturbed. On important nesting and brooding areas (within a 2-mile radius of identified strutting grounds), known sites would be left untreated by removing sagebrush in a mosaic pattern arrangement. Treatment inside the 2-mile radius (16,013 acres) would be by mechanical methods such as plowing. It is estimated this would reduce treatment acreage on six allotments within the 2-mile radius by approximately 10 percent or 1,787 acres. There would be no treatment proposed within the 2-mile radius on the East Woodruff Allotment.

Vegetation on areas outside the 2-mile strutting ground radius would be treated as proposed in Chapter 1. Good and fair condition ranges would be sprayed (28,958 acres) and poor condition ranges would be burned (1,894 acres). All would be seeded.

As a result of these modifications, the acreage proposed for vegetation treatment would be reduced from 65,187 acres (comprised of high, moderate, and low risk soils) to 50,429 acres (comprised of moderate and low risk soils; see Chapter 3 Soils). In addition, eliminate vegetation treatments on 1,777 acres of critical erosion areas in the New Canyon Allotment and 1,787 acres on six allotments because of sage grouse habitat needs. Total area proposed for vegetation treatment would be 46,865 acres at an approximate cost of $328,055. Table 8-12 identifies proposed treatment acreage by allotment and the above mentioned constraints.

On all other areas where vegetation treatment is proposed, reseed if necessary to assure that at least the same amount of ground cover remains after treatment as before. This would add to the cost of the proposed action; however, the extent cannot be determined because of variable site conditions.

On Big Creek and Woodruff Pastures Allotments, delay implementation of vegetation treatments. These allotments contain 6 and 59 percent respectively of the total critical deer winter ranges in the planning unit, and are scheduled for extensive vegetation treatments (table 8-12).

This alternative would delay vegetation treatments on pastures to provide for complete establishment and growth of desirable shrubs above average snow depth before other pastures are treated. This would assure that desirable deer forage would be available during the winter. To accomplish this would take longer than the 2-year establishment period proposed in Chapter 1. This alternative would delay treatment from pasture to pasture for a period of 5 years. For example:

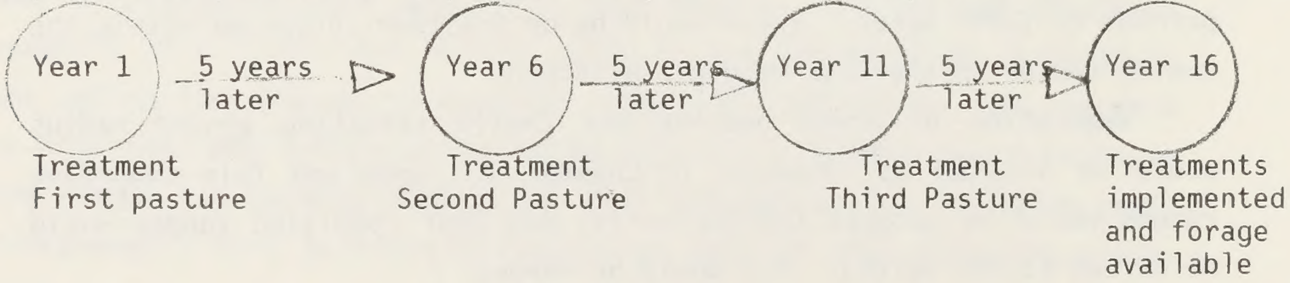

TABLE 8-12

Alternative 3: Proposed Vegetation Treatment Acreage

Allotment	Acres Proposed[a] for Treatment	No Treatment - Acre Reduction Due to:		Acres Proposed for Treatment (2-Mile Radius		
		Critical Erosion	Sage Grouse Inside 2-mile Radius	Inside[b]	Outside[c]	
					Burn	Spray
ALLOTMENTS WITH PRELIMINARY SCS SOIL DATA						
Bear Lake	265	.....	0	0	0	265
Dry Basin	2,264	.....	182	1,638	0	444
Kearl	371	.....	0	0	0	371
Laketown	88	.....	0	0	3	85
Stuart	718	.....	0	0	251	467
Twin Peaks	537	.....	0	0	0	537
Rabbit Creek	2,177	.....	90	790	0	1,297
ALLOTMENTS WITH NO PRELIMINARY SCS SOIL DATA						
Duck Creek	8,492	.....	540	4,810	251	2,891
Big Creek	11,748	.....	455	4,095	0	7,198
Woodruff Pastures	9,965	.....	0	0	1,296	8,669
New Canyon	7,803	1,777	270	2,430	33	3,293
East Woodruff	299	.....	0	0	0	299
Meachum Canyon	1,204	.....	0	0	0	1,204
Sage Creek	4,498	.....	250	2,250	60	1,938
TOTALS	50,429	1,777	1,787	16,013	1,894	28,958

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[a] Proposed acreage in Chapter 1 65,187 reduced to 50,429 acres to reduce risk of seeding failure (Chapter 3, Soils).

[b] Proposed vegetation treatment acreage inside 2-mile radius of important sage grouse areas (see discussion in text) would be accomplished by mechanical treatment (plowing).

[c] Proposed vegetation treatment acreage outside 2-mile radius would be by burning or chemical spraying of 2,4-D as proposed in Chapter 1.

In addition, this alternative would restrict livestock use on previously treated pastures until seedings are successfully established and shrub growth reaches above average snow depth. Increases would begin on a termporary, nonrenewable basis once shrubs reach this height until the allotment is fully treated.

5. Include a wildlife interseeding project on 2,625 acres in the Dry Basin Pasture and Woodruff Pastures Allotments.

The proposed action (Chapter 1) was modified to accommodate a wildlife interseeding. However, it does not include the actual interseeding project itself, only the modification to accommodate management objectives of the project. This alternative would include the actual interseeding project in the proposed action, together with the modification already provided. Livestock use would be restricted as described above in item 4. This alternative would add an additional 2,625 acres of interseeding and $5,000 to the total cost of the proposed action, resulting in a total of 49,490 acres to be treated at a total cost of approximately $333,055.

IMPACT ANALYSIS

Impacts to Soils

During the first 3 years of implementation, fencing riparian areas would reduce erosion on 448 acres. Streambanks along 17 miles of stream would become stablized within 6 to 8 years, thereby eliminating the streambank sloughing problem for these areas identified in Chapter 2.

Beginning the third year, erosion would be reduced on 47,732 acres as a result of proposed vegetation treatments (successful) and reductions in the present level of grazing intensity. This would result in no significant change in present erosion condition on 81,801 acres because of two factors: present grazing level is not sufficiently intense to cause erosion and any of the proposed vegetation treatments that did not prove successful could not result in making additional ground cover available to reduce the existing erosion rate. Erosion would increase on 8,147 acres as a result of land disturbance associated with one or more of these factors: proposed range project construction, unsuccessful seedings (no increase in ground cover), burning and plowing.

Critical erosion conditions on 2,436 acres within the South Woodruff, New Canyon, and Eastman Allotments would be improved due to reductions in grazing intensity and vegetation treatments. No significant change would occur on 1,047 acres within the Deseret and New Canyon Allotments. Existing critical erosion conditions would decline further on 344 acres of land in the New Canyon Allotment as a result of unsuccessful seedings on burned and plowed areas.

Conclusion

Erosion would be reduced on 47,732 acres, increased on 8,147 acres, and remain unchanged on 81,801 acres. Downward trends would be reduced in the Stuart, Big Creek, and Woodruff Pastures Allotments. No significant change would occur to the erosion trend for the Rabbit Creek Allotment.

Table 8-13 provides a summary of the anticipated erosion impacts by allotment.

Impacts to Vegetation

Three-Year Study Period

During the 3-year study period, no measureable change would occur to vegetation. The only exceptions would be an improvement toward ecological climax on 448 acres of riparian habitat due to fencing, and a decline in livestock forage condition on the Dry Basin Pasture of the Woodruff Pastures Allotment (2,625 acres) due to the browse interseeding and rest requirements. The browse interseeding and rest requirements would cause a decrease in 1,644 AUMs of available livestock forage production (Vegetation, Chapter 3) but an increase of 240 AUMs of quality deer forage.

Although the range readiness turn-on date should cause a slight improvement in the vigor of desirable forage species, the increase would not be enough to cause vigor to shift to new levels (good, fair, poor) within the 3-year timeframe.

TABLE 8-13

Alternative 3: Erosion Projection

Allotment	Present Erosion Condition	Erosion Acres Less	 No Change	 More
Bear Lake	Fair	146	969	3
Big Creek	Fair	14,927	3,239	1,859
Deseret	Poor	......	15,367	......
Dry Basin	Good	1,145	887	749
Duck Creek	Fair	9,653	1,301	2,296
Eastman	Poor	3,325	......	......
East Woodruff	Fair	164	1,998	5
Kearl	Good	204	972	7
Laketown	Good	164	3,056	21
Meachum Canyon	Poor	662	1,285	4
Middle Ridge	Good	......	......	......
New Canyon	Fair	3,427	25,928	1,092
Rabbit Creek	Good	1,148	1,749	360
Sage Creek	Good	2,337	6,742	1,049
Session	Fair	......	......	......
South Woodruff	Poor	4,251	......	......
Stuart	Good	395	533	114
Twin Peaks	Good	303	1,988	1
Woodruff Pastures	Fair	5,481	15,787	587
TOTAL		47,732	81,801	8,147

NOTE: Unknown impacts to soil erosion would occur on 2,618 acres proposed for land disposal and recreation site developments (see table 1, Appendix 20).

Initial Adjustment in Livestock Use

The initial adjustment in livestock use (as a result of utilization studies) would result in static or improving conditions to vegetation. Desirable plant vigor would improve slowly due to livestock utilization of key species being held to an estimated 40 percent on 15 allotments, and less than an estimated 40 percent on two allotments. This vigor improvement would be due to increased carbohydrate storage in desirable plant species (especially grasses). The actual percent utilization restriction would probably vary for each allotment depending on study results. As vigor improves, composition of grass would slowly increase and the composition of forbs and shrubs would decrease. This, in turn, would lead to increased livestock forage production. Apparent trend and livestock forage condition would slowly improve with changes in composition. These changes would occur quite slowly. The period of implementation is estimated to be from 6 to 16 years after the 3-year study would be concluded.

Long-Term Management Actions

The initiation of grazing and resting treatments, coupled with vegetation treatments, would result in a more rapid improvement of livestock forage conditions than would occur in the initial action of this alternative. Livestock forage condition would improve over the present situation. Acres in good condition would improve from 52,246 acres to 80,687 acres; fair condition acres would decrease from 68,872 acres to 40,431 acres; poor condition acres would decrease from 7,104 to 4,486 acres. Due to the periodic deferment of grazing (Appendix 5) during the growing season and the restricted level of utilization, vigor of desirable forage species would increase. Douglas (1915 as abstracted in Hickey, 1966), indicated that grazing after the growing season resulted in plant vigor similar to ungrazed plants, while grazing during the growing season year after year resulted in lowered vigor. Acres in good vigor should increase from 6,478 to 93,670 acres. Fair acres would decline from 112,432 to 44,010 acres. Poor acres would decline from 21,388 to 0 acres. This would result in an increase in livestock forage production, from 22,350 AUMs to 22,808 AUMs.

Apparent trend should also improve. Acres in upward trend would increase from 10,524 to 70,342 acres. Static acres would decline from 75,811 to 55,262 acres. Acres in downward trend would decrease from 41,887 to 0 acres.

Proposed vegetation treatments would impact vegetation by changing the composition from sagebrush type to grass type. Vegetation treatment (by fire and chemical means) would destroy much of the existing vegetation in the treated areas. Data in Valentine (1971) and Linne (1978) indicate that at least 3 years would be required to restore normal production to many desirable forage species following treatment by fire. This would occur on 1,894 acres proposed for burning (table 8-12).

Chemical treatment by the application of 2,4-D would be expected to greatly reduce forbs and shrubs, but have little impact on grasses. Immediately following application of the herbicide, there would be a partial to complete reduction of competitive species. This would allow individual grass plants to increase in size and numbers. Although there would be substantial reduction in the compositin of forbs and shrubs, they would begin to recover toward pretreatment levels in the first year after treatment. This would occur on 28,958 acres proposed for chemical spraying. A more complete discussion of the effects of spraying is found in Chapter 3, Vegetation.

Treatment by plowing would also be disruptive to vegetation. The uprooting of shrub species, particularly big sagebrush, would occur, followed by seeding of desirable grass and shrub forage. Initially, vigor, livestock forage production and condition, and apparent trend would decline from pretreatment levels. Seeding success would be more assured as a result of plowing, however, since seedbed preparation and actual placement of seed into the ground would be part of the process that would be used. Establishment would be rapid and vegetation composition favoring grass species would result. Plowing treatment would be proposed for 16,013 acres (table 8-12).

In the long term (20 years), proposed vegetation treatments would cause improvement in the livestock forage condition and an increase in livestock forage production described above, once the treatments are fully established (within 5 years of treatment) due to the shift in composition favoring grass species.

Utilization would increase to nearly 50 percent on key forage species once additional forage becomes available on treated areas. Existing utilization on nontreated areas may decline since livestock and wildlife would be attracted to newly established seedings. This would help restore vigor and condition of these areas, although improvement would be slight in 20 years.

Under this alternative, density would remain unchanged since grass composition increases (from 30 to 40 percent) would be offset by decreases in forb and shrub compositions (from 10 to 8 percent and 60 to 52 percent, respectively.

Table 8-14 presents a summary of predicted impacts to vegetation after full implementation (20 years).

Conclusion

This alternative would improve existing livestock forage condition. The amount of good condition range would increase from 41 to 64 percent, fair condition range would decrease from 54 to 34 percent, and poor condition range would decrease from 5 to 2 percent. Livestock forage production would be maintained at 22,808 AUMs upon full implementation.

Impacts to Surface Water Quality

Exclusion of livestock use on 16.5 miles of aquatic/riparian habitat would reduce or eliminate streambank sloughing and improve water quality with the fenced areas.

The impact to water quality as a result of delaying the implementation schedule for 3 years is unknown. However, exclusion of livestock on the proposed streams would produce immediate improvement to existing water quality conditions. Physical damage from trampling of streambanks would be eliminated, and sedimentation rates would be reduced as a result of increased bank cover. Water quality in Big Creek, New Canyon, and Twin Peaks Allotments would be improved.

TABLE 8-14

Alternative 3: Predicted Impacts to Vegetation After Full Implementation (20 Years)

Allotment	Livestock Forage Condition (Suitable Acres)			Apparent Trend (Suitable Acres)		Desirable Plant Vigor	Percent Utilization of Key Species	Composition and Density	
		Cattle	Sheep						
Bear Lake	Good	735	1,058	Up	764	Good	43	Density	No change
	Fair	323	0	Static	294			Grass	Increase
	Poor	0	0	Down	0			Forb	Decrease
	Unsuitable	60	60	Unsuitable	60			Shrub	Decrease
Big Creek	Good	13,643	15,963	Up	10,095	Fair	47	Density	No change
	Fair	3,785	1,465	Static	7,333			Grass	Increase
	Poor	0	0	Down	0			Forb	Decrease
	Unsuitable	2,597	2,597	Unsuitable	2,597			Shrub	Decrease
Deseret	Good	7,211	11,145	Up	1,504	Fair	40	Density	No change
	Fair	7,009	3,075	Static	12,716			Grass	No change
	Poor	0	0	Down	0			Forb	No change
	Unsuitable	1,147	1,147	Unsuitable	1,147			Shrub	No change
Dry Basin	Good	2,715	2,715	Up	2,715	Good	48	Density	No change
	Fair	0	0	Static	0			Grass	Increase
	Poor	0	0	Down	0			Forb	Decrease
	Unsuitable	66	66	Unsuitable	66			Shrub	Decrease
Duck Creek	Good	7,357	12,773	Up	12,864	Good	46	Density	No change
	Fair	5,407	404	Static	313			Grass	Increase
	Poor	413	0	Down	0			Forb	Decrease
	Unsuitable	73	73	Unsuitable	73			Shrub	Decrease

(continued)

TABLE 8-14 (continued)

Allotment	Livestock Forage Condition (Suitable Acres)	Cattle	Sheep	Apparent Trend (Suitable Acres)		Desirable Plant Vigor	Percent Utilization of Key Species	Composition and Density	
Eastman	Good	116	2,563	Up	521	Fair	40	Density	No change
	Fair	1,796	698	Static	2,740			Grass	No change
	Poor	1,349	0	Down	0			Forb	No change
	Unsuitable	64	64	Unsuitable	64			Shrub	No change
East Woodruff	Good	930	2,167	Up	2,167	Good	22	Density	No change
	Fair	1,237	0	Static	0			Grass	Increase
	Poor	0	0	Down	0			Forb	Decrease
	Unsuitable	0	0	Unsuitable	0			Shrub	Decrease
Kearl	Good	752	1,183	Up	1,183	Good	43	Density	No change
	Fair	431	0	Static	0			Grass	Increase
	Poor	0	0	Down	0			Forb	Decrease
	Unsuitable	0	0	Unsuitable	0			Shrub	Decrease
Laketown	Good	1,343	2,445	Up	2,524	Good	40	Density	No change
	Fair	1,104	2	Static	0			Grass	Increase
	Poor	77	77	Down	0			Forb	Decrease
	Unsuitable	717	717	Unsuitable	717			Shrub	Decrease
Meachum Canyon	Good	1,280	1,744	Up	1,830	Good	36	Density	No change
	Fair	550	86	Static	0			Grass	Increase
	Poor	0	0	Down	0			Forb	Decrease
	Unsuitable	121	121	Unsuitable	121			Shrub	Decrease
Middle Ridge	* * * * * * * * * * * * * * * * * * * DISPOSAL *								

(continued)

TABLE 8-14 (continued)

Allotment	Livestock Forage Condition (Suitable Acres)			Apparent Trend (Suitable Acres)		Desirable Plant Vigor	Percent Utilization of Key Species	Composition and Density	
		Cattle	Sheep						
New Canyon	Good	24,808	28,654	Up	7,484	Good	42	Density	No change
	Fair	3,798	0	Static	21,170			Grass	Increase
	Poor	48	0	Down	0			Forb	Decrease
	Unsuitable	1,793	1,793	Unsuitable	1,793			Shrub	Decrease
Rabbit Creek	Good	2,049	3,191	Up	3,191	Good	46	Density	No change
	Fair	1,142	0	Static	0			Grass	Increase
	Poor	0	0	Down	0			Forb	Decrease
	Unsuitable	66	66	Unsuitable	66			Shrub	Decrease
Sage Creek	Good	4,408	9,056	Up	9,056	Good	44	Density	No change
	Fair	4,648	0	Static	0			Grass	Increase
	Poor	0	0	Down	0			Forb	Decrease
	Unsuitable	1,072	1,072	Unsuitable	1,072			Shrub	Decrease
Session	* DISPOSAL *								
South Woodruff	Good	101	1,106	Up	5	Fair	40	Density	No change
	Fair	2,625	2,640	Static	3,894			Grass	No change
	Poor	1,173	153	Down	0			Forb	No change
	Unsuitable	352	352	Unsuitable	352			Shrub	No change
Stuart	Good	544	1,005	Up	132	Fair	47	Density	No change
	Fair	353	0	Static	873			Grass	Increase
	Poor	108	0	Down	0			Forb	Decrease
	Unsuitable	37	37	Unsuitable	37			Shrub	Decrease

(continued)

TABLE 8-14 (concluded)

Allotment	Livestock Forage Condition (Suitable Acres)	Cattle	Sheep	Apparent Trend (Suitable Acres)		Desirable Plant Vigor	Percent Utilization of Key Species	Composition and Density	
Twin Peaks	Good	1,966	2,292	Up	2,292	Good	42	Density	No change
	Fair	326	0	Static	0			Grass	Increase
	Poor	0	0	Down	0			Forb	Decrease
	Unsuitable	0	0	Unsuitable	0			Shrub	Decrease
Woodruff Pastures	Good	10,729	15,070	Up	12,015	Good	45	Density	No change
	Fair	5,897	2,874	Static	5,929			Grass	Increase
	Poor	1,318	0	Down	0			Forb	Decrease
	Unsuitable	3,911	3,911	Unsuitable	3,911			Shrub	Decrease
TOTALS	Good	80,687	114,130	Up	70,342				
	Fair	40,431	11,244	Static	55,262				
	Poor	4,486	230	Down	0				
	Unsuitable	12,076	12,076	Unsuitable	12,076				
		137,680	137,680		137,680				

NOTE: The above acreages do not include 2,618 acres proposed for land disposal and recreation site development.

on the proposed streams would produce immediate improvement to existing water quality conditions. Physical damage from trampling of streambanks would be eliminated, and sedimentation rates would be reduced as a result of increased bank cover. Water quality in Big Creek, New Canyon, and Twin Peaks Allotments would be improved.

Vegetation treatments proposed to accommodate soils (critical erosion areas and high probability of seeding success) would reduce runoff and improve water quality on fenced areas on the 14 allotments proposed for vegetation treatment.

Conclusion

Water quality would improve on three allotments due to fencing of riparian areas and on 11 allotments proposed for treatments.

Impacts to Wildlife

The 3-year cooperative study between BLM and UDWR would determine critical use areas for sage grouse and deer, provide guidelines for managing those areas, and provide BLM with necessary guidelines to manage livestock grazing in Rich County without producing major declines and displacement of wildlife populations.

Allocating forage (16,119 AUMs) on an actual use basis and reducing the livestock grazing season would ensure that the present deer herds would receive the necessary quality and quantity forage. Actual use levels and length of livestock grazing seasons would need to be determined by the cooperative livestock study before the proposed action would be implemented. Staggering pasture grazing and treatment schedules in adjacent allotments would reduce the forage shortages that would occur on adjacent critical deer winter ranges.

Implementing the Dry Basin Pasture interseeding would provide an additional 240 good quality AUMs in the Woodruff Pastures Allotment. Currently, this allotment lacks preferred deer forage species.

These measures would provide the deer with enough quality forage (8,513 AUMs) to maintain healthy herds at current levels.

Using the 40-percent allocation level for livestock use, any forage reallocation based on actual use studies would not fully meet long-term deer herd needs with adequate quality forage. Future predicted expansion of the deer herds would create the forage shortages (3,282 AUMs) listed on table 8-15. These shortages would create malnutrition and starvation within the deer herds. However, in reality, the studies would probably indicate either the need to harvest more deer or reduce livestock numbers and the shortages would be alleviated. Shortages that occur in attainment of maximum deer herd expansion would be reduced compared to predicted shortages under current management.

Adjusting the livestock turn-on date to range readiness would provide a moderate forage competition advantage for young sage grouse in years where plant development is delayed. During those years when plant development is early, young grouse would be at a moderate disadvantage as livestock would be on the range when the chicks hatch.

Vegetation treatments would remove cover and forage for sage grouse and deer. However, guidelines developed by the cooperative study would protect critical habitat areas and minimize these impacts. It is estimated that the proposed restrictions would be effective in protecting 50 percent of known high value sage grouse habitat. Further, delaying treatments of adjacent areas until previously treated areas are able to support wildlife would reduce forage shortages and wildlife displacements to moderate levels.

Impacts from this alternative would produce either no change or a moderate decrease in the current sage grouse population levels.

The proposed stream fencing would protect 448 acres of riparian habitat to improve from poor and fair condition to excellent condition. This would provide major improvements in habitat diversity and forage within 17 miles of riparian habitat areas (16.5 proposed miles plus 0.5 mile in Big Creek exclosure). Wildlife species dependent upon riparian habitat would improve in diversity and size within the fenced areas while populations outside the fenced areas would decline in size and diversity. The 16.75 unfenced miles would continue to degrade. Proposed antelope AUM allocations would only be available for Duck Creek Allotment and the antelope introduction would not be possible.

TABLE 8-15

Alternative 3: Future Available Deer Forage (AUMs)

Allotment	Seasonal Use			Critical Deer Winter Range		
	Total Allocation Level	10-Year Demand	Shortfall	Total Allocation Level	10-Year Demand	Shortfall
Bear Lake	......	......	.....	335	217	.....
Big Creek	2,839	1,646	.....	350	227	.....
Deseret[a]	......	......	.....	.....	68	68
Dry Basin[a]	......	564	564	.....	.....	.....
Duck Creek	1,288	678	.....	.....	.....	.....
Eastman	275	330	55	121	150	29
East Woodruff	261	518	257	.....	.....	.....
Kearl	163	235	72	.....	.....	.....
Laketown	124	188	64	.....	.....	.....
Meachum Canyon	128	186	58	129	184	55
Middle Ridge[b]	......	251	251	37	67	30
New Canyon	3,975	2,622	......	.....	.....	.....
Rabbit Creek	152	395	243	.....	.....	.....
Sage Creek	847	1,254	407	.....	.....	.....
Session[b]	......	40	40	.....	.....	.....
South Woodruff	256	414	158	400	646	246
Stuart	......	......	......	214	255	.....
Twin Peaks[a]	......	461	461	.....	.....	.....
Woodruff Pastures	1,832	1,286	......	2,251	2,704	183
TOTAL[c]	12,012	11,068	2,630	4,107	4,518	652

---

[a] Deseret, Dry Basin, and Twin Peaks Allotments lost their wildlife forage to livestock when livestock utilization was raised to the 40-percent level.

[b] AUM allocations were lost through land disposals, however, the demand still exists.

[c] Totals are not additive as the allocations do not match demands.

Vegetation treatments proposed to accommodate soils (critical erosion areas and high probability of seeding success) would reduce runoff and improve water quality on fenced areas on the 14 allotments proposed for vegetation treatment.

Conclusion

Water quality would improve on three allotments due to fencing of riparian areas and on 11 allotments proposed for treatments.

Impacts to Wildlife

The 3-year cooperative study between BLM and UDWR would determine critical use areas for sage grouse and deer, provide guidelines for managing those areas, and provide BLM with necessary guidelines to manage livestock grazing in Rich County without producing major declines and displacement of wildlife populations.

Allocating forage (16,119 AUMs) on an actual use basis and reducing the livestock grazing season would ensure that the present deer herds would receive the necessary quality and quantity forage. Actual use levels and length of livestock grazing seasons would need to be determined by the cooperative livestock study before the proposed action would be implemented. Staggering pasture grazing and treatment schedules in adjacent allotments would reduce the forage shortages that would occur on adjacent critical deer winter ranges.

Implementing the Dry Basin Pasture interseeding would provide an additional 240 good quality AUMs in the Woodruff Pastures Allotment. Currently, this allotment lacks preferred deer forage species.

These measures would provide the deer with enough quality forage (8,513 AUMs) to maintain healthy herds at current levels.

Using the 40-percent allocation level for livestock use, any forage reallocation based on actual use studies would not fully meet long-term deer herd needs with adequate quality forage. Future predicted expansion of the deer herds would create the forage shortages (3,282 AUMs) listed on table 8-15. These shortages would create malnutrition and starvation within the deer herds. However, in reality, the studies would probably indicate either the need to harvest more deer or reduce

TABLE 8-15

Alternative 3: Future Available Deer Forage (AUMs)

	Seasonal Use			Critical Deer Winter Range		
Allotment	Total Allocation Level	10-Year Demand	Shortfall	Total Allocation Level	10-Year Demand	Shortfall
Bear Lake	......	......	.....	335	217	.....
Big Creek	2,839	1,646	.....	350	227	.....
Deseret[a]	......	......	.....	.....	68	68
Dry Basin[a]	......	564	564	.....	.....	.....
Duck Creek	1,288	678	.....	.....	.....	.....
Eastman	275	330	55	121	150	29
East Woodruff	261	518	257	.....	.....	.....
Kearl	163	235	72	.....	.....	.....
Laketown	124	188	64	.....	.....	.....
Meachum Canyon	128	186	58	129	184	55
Middle Ridge[b]	......	251	251	37	67	30
New Canyon	3,975	2,622	......	.....	.....	.....
Rabbit Creek	152	395	243	.....	.....	.....
Sage Creek	847	1,254	407	.....	.....	.....
Session[b]	......	40	40	.....	.....	.....
South Woodruff	256	414	158	400	646	246
Stuart	......	......	......	214	255	.....
Twin Peaks[a]	......	461	461	.....	.....	.....
Woodruff Pastures	1,832	1,286	......	2,251	2,704	183
TOTAL[c]	12,012	11,068	2,630	4,107	4,518	652

[a] Deseret, Dry Basin, and Twin Peaks Allotments lost their wildlife forage to livestock when livestock utilization was raised to the 40-percent level.

[b] AUM allocations were lost through land disposals, however, the demand still exists.

[c] Totals are not additive as the allocations do not match demands.

livestock numbers and the shortages would be alleviated. Shortages that occur in attainment of maximum deer herd expansion would be reduced compared to predicted shortages under current management.

Adjusting the livestock turn-on date to range readiness would provide a moderate forage competition advantage for young sage grouse in years where plant development is delayed. During those years when plant development is early, young grouse would be at a moderate disadvantage as livestock would be on the range when the chicks hatch.

Vegetation treatments would remove cover and forage for sage grouse and deer. However, guidelines developed by the cooperative study would protect critical habitat areas and minimize these impacts. It is estimated that the proposed restrictions would be effective in protecting 50 percent of known high value sage grouse habitat. Further, delaying treatments of adjacent areas until previously treated areas are able to support wildlife would reduce forage shortages and wildlife displacements to moderate levels.

Impacts from this alternative would produce either no change or a moderate decrease in the current sage grouse population levels.

The proposed stream fencing would protect 448 acres of riparian habitat to improve from poor and fair condition to excellent condition. This would provide major improvements in habitat diversity and forage within 17 miles of riparian habitat areas (16.5 proposed miles plus 0.5 mile in Big Creek exclosure). Wildlife species dependent upon riparian habitat would improve in diversity and size within the fenced areas while populations outside the fenced areas would decline in size and diversity. The 16.75 unfenced miles would continue to degrade. Proposed antelope AUM allocations would only be available for Duck Creek Allotment and the antelope introduction would not be possible.

Conclusion

This alternative would provide enough quality forage to maintain healthy herds at the current levels. Forage shortages would develop in the long term and the deer herds would not reach the UDWR desired levels. Sage grouse population would remain at current levels. Nongame species diversity and population levels would increase in fenced riparian areas and continue to decrease in unfenced areas.

Impacts to Fishery Habitat

Fencing additional riparian areas would improve existing fisheries values. It would involve total exclusion of livestock on 16.5 miles of fisheries habitat. A total of 9.25 miles of aquatic/riparian habitat would improve to good condition. The remaining 7.25 miles would improve to excellent condition and would support the introduction of the sensitive Bonneville (Utah) cutthroat trout.

Because of continued livestock use on the remaining streams in poor condition, impacts similar to those cited in Chapter 3 would occur. Specifically, removal of riparian vegetation, streambank trampling, soil erosion, and streambottom and pool quality deterioration through sedimentation would result. Table 8-16 identifies impacts to fisheries for each stream in the ES area.

Conclusion

Exclusion of livestock on the 16.5 miles proposed, plus the 0.5-mile existing exclosure, would improve 17 of the 35.5 miles of the total aquatic/riparian habitat on public land. There would be 16.75 miles of habitat on BLM-administered lands not protected by fencing.

Impacts to Archaeological and Historical Resources

Any existing damage to archaeological and historical resources from livestock trampling would be diminished. Watersheds would become more stable, protecting undiscovered sites from damage by accelerated erosion.

Impacts to Visual Resources

The portions of this alternative affecting soils, wildlife, and fisheries would result in increased vegetation cover and diversity unitwide, particularly along riparian zones. Resulting natural variety in vegetation color, size, and species diversity would improve scenic quality.

Impacts to Recreation

Total protection of 17 miles of riparian zones would improve fishery and wildlife habitat for most game and nongame species in the area.

TABLE 8-16

Alternative 3: Aquatic/Riparian and Fisheries Habitat - Present and Predicted Future Conditions

	Habitat Acres				CONDITION			
				Total	Present		Alternative	
Allotment	Aquatic[a]	Riparian[b]	Stream	Miles	Miles		Miles	
Rabbit Creek	0.3	33	North Fork Six-mile	0.25	0.25	Poor	0.25	Poor
Duck Creek	1.1	175	South Fork Six-mile	3.25	3.25	Poor	3.25	Poor
			North Fork Sage (upper reach)	0.75	0.75	Poor	0.75	Poor
Sage Creek	1.0	83	North Fork Sage (lower reach)	1.25	1.25	Poor	1.25	Poor
			Sage Creek	2.0	0.5	Fair	0.5	Fair
					1.5	Poor	1.5	Poor
Laketown	3.8	93	Laketown (lower reach)	4.0	0.5	Fair	4.0	Good[d]
					3.5	Poor		
Twin Peaks	1.4	35	Laketown (upper reach)	1.5	0.5	Fair	1.5	Good[d]
					1.0	Poor	0.5	Excellent
New Canyon	6.5	357	North Fork Otter Creek	5.0	3.0	Fair	5.0	Excellent
					2.0	Poor		
			Middle Fork Otter Creek	1.75	1.75	Poor	1.75	Excellent
			South Fork Otter Creek	0.75	0.75	Poor	0.75	Good[d]
			New Canyon Creek	1.0	1.0	Poor	1.0	Poor
			Spring Creek	0.5	0.5	Poor	0.5	Good[d]
			Little Creek	1.25	1.25	Poor	1.25	Good[d]
			Old Canyon Creek	1.75	0.75	Fair	0.75	Fair
					1.0	Poor	1.0	Poor

(continued)

TABLE 8-16 (concluded)

Allotment	Habitat Acres		Stream	Total	CONDITION			
					Present		Long Term	
	Aquatic[a]	Riparian[b]		Miles	Miles		Miles	
Big Creek	9.1	151	Randolph Creek	3.0	1.25	Fair	1.75	Good[d]
					1.75	Poor	1.25	Poor
			Big Creek (exclosure)	0.5	0.5	Good	0.5	Excellent
			Big Creek (outside (exclosure)	2.5	0.5	Fair	0.5	Fair
					2.0	Poor	2.0	Poor
Woodruff Pastures	1.6	18	Birch Creek	0.75	0.25	Fair	0.25	Fair
					0.5	Poor	0.5	Poor
Middle Ridge	1.7	38	Walton Creek	1.5	0.5	Fair	0.5	Fair
					1.0	Poor	1.0	Poor
			Woodruff Creek	0.25	0.25	Fair	0.25	Fair
South Woodruff-Meachum Canyon	0.9	48	Home A[c] (natural channel)	1.0	1.0	Poor	1.0	Poor
			Home B[c] (old ditch channel)	1.0	1.0	Poor	1.0	Poor
TOTAL	27.4	1,031		35.5	0.5	Good	7.25	Excellent
					8.0	Fair	9.75	Good
					27.0	Poor	2.75	Fair
							15.75	Poor

Source: Wiche, 1975

NOTE: Underlined streams are proposed for livestock exclusion under this alternative.

[a] Aquatic habitat is the wetted portion of the stream.

[b] Riparian habitat is the wetland streamside vegetation habitat next to the stream.

[c] Home A and B are two channels parallel and adjacent to each other.

[d] Aquatic habitat for sensitive Bonneville (Utah) cutthroat trout would improve to good, but not excellent due to continued livestock use upstream. Riparian vegetation would probably improve to excellent condition, however.

Wildlife viewing opportunities, in particular, would increase along riparian zones. The proposed wildlife and soils modifications would provide better mule deer and sage grouse habitat, resulting in larger game populations and better hunting opportunities. A high percentage of seeding success on vegetation treatments would improve the visual perception of these projects; plant establishment would likely be rapid and impacts resulting from initial disturbance would be minimized.

Quality camping opportunities would improve at developed and undeveloped sites through reduction and (at developed sites) elimination of livestock use.

Impacts to Natural Values

Natural values would improve unitwide. Ecological processes would be enhanced. Management for natural and scenic values in the proposed Laketown Canyon ACEC would also be enhanced.

Impacts on Rancher Incomes

This alternative has five elements which would affect the Rich County livestock industry:

1. Exclusion of livestock from selected aquatic/riparian and land disposal areas;
2. Delay of the implementation schedules of the proposed action (Chapter 1);
3. Modification of seasons of use to conform with strict range readiness criteria;
4. Modification of proposed vegetation treatments to reduce their impacts on soil and wildlife values, and;
5. Performance of a wildlife interseeding project on the Woodruff Pastures Allotment.

The overall average net effect of this alternative on grazing capacities, as compared with the past active authorized use (Appendix 4), could be a 14-percent reduction for the average operator in the small scale class, a 5-percent reduction for the average medium scale operation, and an average 3-percent reduction for large scale. These figures are only estimates and could change considerably when studies would be completed. The budgetary effects of these reductions, prorated by seasonal dependency on BLM grazing, are portrayed in table 8-17. Potential direct income loss would be:

Small Scale	$ 553	x	37	=	$ 20,461
Medium Scale	2,200	x	33	=	72,600
Large Scale	6,590	x	14	=	92,260
					$185,321

As seen in table 8-17, the small scale rancher receives the largest percentage reduction, but the largest financial impact would probably fall on the average medium size operation because it is currently operating at a loss and would be put into an even larger deficit position by this alternative. However, based upon the magnitude of these reductions, it is not anticipated that there would be a measurable change in county-wide income or employment levels.

Impacts to Local Values and Attitudes

This alternative could impact the attitudes and socio-cultural values of Rich County residents. The most directly affected would be the 84 BLM livestock permittees and their families. Initially, an attitude of hostility and opposition would likely prevail, and the perception of increased government control and restrictions to existing livestock-based lifestyles would occur. In the long term, as additional livestock forage would become available and proposed allocations would be made (to the extent proposed objectives are being achieved), these feelings could likely shift to a more cooperative and understanding attitude. Attitudes of other users of public lands in Rich County would likely be in support of this alternative and the benefits it would create. Recreation and wildlife interests would be enhanced and individuals experiencing these opportunities would feel their lifestyles and values were being improved.

TABLE 8-17

Alternative 3: Effects of Reduction of Impacts

	Small Scale		Medium Scale		Large Scale	
	Existing Situation	Alternative 3 Full Implementation	Existing Situation	Alternative 3 Full Implementation	Existing Situation	Alternative 3 Full Implementation
Average number head	65	61	283	266	536	504
AUMs	1,022	961	3,530	3,318	7,637	7,179
Average gross income	$9,218.00	$8,665.00	$36,667.00	$34,467.00	$109,818.00	$103,228.00
Average fixed costs	4,998.00	4,998.00	23,816.00	23,816.00	48,820.00	48,820.00
Average variable costs	2,793.00	2,625.00	23,764.00	22,338.00	17,768.00	16,702.00
Average net income	1,427.00	1,042.00	(-10,903.00)	(-11,687.00)	43,230.00	37,706.00
Net income per AUM	1.40	1.08	(-3.09)	(-3.52)	5.66	5.25
Break-even point	$7,171.00	$7,171.00	$67,645.00	$67,678.00	$58,243.00	$58,243.00
Seasonal dependence (percent)	42	0	24	0	34	0

ALTERNATIVE 4 - NO ACTION

DESCRIPTION

This alternative allows for continuing the present level of livestock use. Existing conditions and trends discussed in Chapter 2 would continue. Grazing management intensity would be similar to the existing situation; forage allocation to livestock would be the same as shown on Appendix 6 (22,898 AUMs). There would still be the same number of allotments as under present management. There would be no fencing of riparian habitat, although the Big Creek exclosure would remain. There would be no land disposals or recreation site development.

IMPACT ANALYSIS

Impacts to Soil Erosion

Based upon present erosion trends (table 2-5), it is probable that allowing the existing situation to continue would result in reducing erosion on areas currently in upward trend and increasing erosion on areas in a downward trend. No significant change to erosion would occur on areas in static trend. Due to a lack of trend data, erosion impacts cannot be predicted for the Session and Twin Peaks Allotments (2,530 acres).

The existing critical erosion condition (table 2-4) on Deseret, Eastman, New Canyon, and South Woodruff Allotments (a total of 3,827 acres) would continue.

Table 8-18 provides a summary of the anticipated impacts by allotment.

Conclusion

Erosion would be reduced on 14,265 acres, increased on 34,296 acres, and would remain unchanged on 89,207 acres. Impacts cannot be predicted for 2,530 acres.

TABLE 8-18

Alternative 4: Erosion Projection

Allotment	Present Erosion Condition	Erosion Acres			Unknown[a] Impacts
		Less	No Change	More	
Bear Lake	Fair	240	479	479	......
Big Creek	Fair	......	11,394	8,952	......
Deseret	Poor	1,400	11,201	2,956	......
Dry Basin	Good	......	2,781	......	......
Duck Creek	Fair	......	11,533	1,877	......
Eastman	Poor	409	1,498	1,498	......
East Woodruff	Fair	715	1,452	......	......
Kearl	Good	189	994	......	......
Laketown	Good	1,296	1,945	......	......
Meachum Canyon	Poor	1,405	546	......	......
Middle Ridge	Good	746	540	......	......
New Canyon	Poor	3,986	18,399	8,280	......
Rabbit Creek	Good	......	2,443	814	......
Sage Creek	Good	2,944	7,209	......	......
Session	Fair	......	......	......	238
South Woodruff	Poor	935	1,658	1,658	......
Stuart	Good	......	260	782	......
Twin Peaks	Good	......	......	......	2,292
Woodruff Pastures	Fair	......	14,875	7,000	......
TOTAL		14,265	89,207	34,296	2,530

[a] Unknown impacts to soil erosion would occur on these acres due to lack of trend data.

Impacts to Vegetation

Without a change in present management actions relating to livestock, current trends in vegetation are expected to continue. At present, there are 10,524 acres in upward apparent trend, 75,811 acres in static apparent trend, and 41,887 acres in downward apparent trend. Continual grazing during the spring heavy utilization on desirable plants, and continued competition between livestock and wildlife would cause apprent trends to continue and would ultimately affect other resource categories.

If current apparent trend values continue long enough, existing livestock forage condition would change as follows: 52,246 acres in good condition would decline to 10,524 good condition acres, 68,872 acres in fair condition would increase to 75,811 fair condition acres, and 7,104 acres in poor condition would increase to 41,887 poor acres. This is due to the fact that upward, static, or downward trend would be reflected in improving, static, or decreasing livestock forage condition, respectively. Acres in upward trend, for example, would eventually be in good livestock forage condition if the trend continues long enough. Table 8-19 presents a summary of predicted impacts by allotment. Desirable plant vigor would decline and utilization would decrease as desirable plants gradually become removed from the vegetation composition. These plants would eventually be replaced by undesirable, invader species, predominately shrubs such as big sagebrush and rabbitbrush.

It should be noted that all of the above predicated changes would occur very slowly, possibly taking 10 years or more before measureable changes had occurred.

Conclusion

With no change in present management, conditions would decline overall. Livestock forage condition would decrease to 10,524 acres in good condition, 75,811 acres fair, and 41,887 acres poor. Livestock forage production would decrease to 22,187 AUMs.

TABLE 8-19

Alternative 4: Predicted Impacts to Average Vegetation Resource Categories

Allotment	Livestock Forage Condition	Apparent Trend	Vigor of Desirable Forage Species	Utilization of Key Species	Composition			AUMs Livestock Forage Production	
					Grass	Forbs	Shrubs		
Bear Lake	Improve	Improve	Improve	Decrease	Increase	Decrease	Decrease	Up 5% to	176
East Woodruff	Improve	Improve	Improve	Decrease	Increase	Decrease	Decrease	Up 5% to	184
Kearl	Improve	Improve	Improve	Decrease	Increase	Decrease	Decrease	Up 5% to	529
Laketown	Improve	Improve	Improve	Decrease	Increase	Decrease	Decrease	Up 5% to	314
Meachum Canyon	Improve	Improve	Improve	Decrease	Increase	Decrease	Decrease	Up 5% to	277
Middle Ridge	Improve	Improve	Improve	Decrease	Increase	Decrease	Decrease	Up 5% to	108
Sage Creek	Improve	Improve	Improve	Decrease	Increase	Decrease	Decrease	Up 5% to	1,088
Twin Peaks	Improve	Improve	Improve	Decrease	Increase	Decrease	Decrease	Up 5% to	285
Dry Basin	Static	Static	Static	Static	Static	Static	Static	Static at	471
Rabbit Creek	Static	Static	Static	Static	Static	Static	Static	Static at	484
Session	Static	Static	Static	Static	Static	Static	Static	Static at	40
Big Creek	Decline	Decline	Decline	Decrease	Increase	Decrease	Decrease	Down 5% to	3,686
Deseret	Decline	Decline	Decline	Decrease	Increase	Decrease	Decrease	Down 5% to	2,306
Duck Creek	Decline	Decline	Decline	Decrease	Increase	Decrease	Decrease	Down 5% to	1,929
Eastman	Decline	Decline	Decline	Decrease	Increase	Decrease	Decrease	Down 5% to	616
New Canyon	Decline	Decline	Decline	Decrease	Increase	Decrease	Decrease	Down 5% to	349
Stuart	Decline	Decline	Decline	Decrease	Increase	Decrease	Decrease	Down 5% to	97
Woodruff Pastures	Decline	Decline	Decline	Decrease	Increase	Decrease	Decrease	Down 5% to	4,564
								TOTAL	22,187

NOTE: The above are the impacts expected after 10 years. It is estimated that livestock forage production would increase or decrease by 5 percent in line with other resource values.

Impacts to Surface Water Quality

Continued grazing of aquatic/riparian habitats would result in a reduction of existing water quality on 35 miles of streams in the Randolph ES area. The water quality in 0.5 mile of the existing Big Creek exclosure would not be changed. No measurable changes in water quality would occur from other actions.

Impacts to Wildlife

Maintaining current livestock management practices would allow existing wildlife conditions and trends within the planning unit to continue. Most habitat for deer and sage grouse would continue to deteriorate, and habitat for other species would remain in poor to fair condition. Under these conditions, any increases in wildlife populations would result in an accelerated rate of habitat deterioration. Continuing current grazing practices would limit the possibility for improving wildlife habitats.

Critical deer winter range would continue to deteriorate and other seasonal ranges would probably remain in fair condition. However, deer populations, currently at low levels, are increasing, placing greater burdens upon the habitat. Present management practices would not be sufficient to produce the quality of habitat and forage necessary to support potential deer populations. The proposed 27,482 AUM allocation to wildlife would only provide 8,362 usable AUMs resulting in a 7,931 AUM shortage. Projected future deer forage shortages are listed in table 8-20.

Past land treatments and continued heavy livestock use of riparian and meadow areas have reduced much sage grouse habitat to poor condition. Any remaining habitat has degraded to fair condition, and the sage grouse populations have diminished accordingly (Wildlife, URA Step 3). Continuing these trends would lead to further decline of the sage grouse populations and their supportive habitat.

Livestock overgrazing of riparian and meadow areas has eliminated willows and associated shrubs from most streams in the Randolph Planning Unit, reducing the habitat quality and diversity. Wildlife species

TABLE 8-20

Alternative 4: Future Deer Forage Shortages

	AUMs					
	Seasonal Demand			Critical Deer Winter Range		
Allotment	Available	Demand	Shortfall	Available	Demand	Shortfall
Bear Lake	.....	.....	.....	184	217	33
Big Creek	969	1,646	677	125	227	102
Deseret	.....	.....	.....	738	68	.....
Dry Basin	134	564	430	.....	.....	.....
Duck Creek	522	678	156	.....	.....	.....
Eastman	156	330	174	68	150	82
East Woodruff	125	518	393	.....	.....	.....
Kearl	55	235	180	.....	.....	.....
Laketown	112	188	76	117	184	67
Meachum Canyon	87	186	99	30	67	37
Middle Ridge	59	251	192	0	0	0
New Canyon	1,556	2,622	1,066	.....	.....	.....
Rabbit Creek	156	395	239	.....	.....	.....
Sage Creek	388	1,254	866	.....	.....	.....
Session	14	40	26	.....	.....	.....
South Woodruff	190	414	224	297	646	349
Stuart	.....	.....	.....	115	255	140
Twin Peaks	87	461	374	.....	.....	.....
Woodruff Pastures	929	1,286	357	1,222	2,704	1,482
TOTALS	5,466	11,068	5,602	2,896	4,518	2,292

dependent upon riparian habiatat have undergone similar declines and would continue to do so.

Wildlife URA Step 3 data do not suggest any appreciable habitat changes for the remaining wildlife species if the present management practices continue. Present management methods offer very limited opportunities for wildlife habitat improvements and few major species would reach their potentials. Proposed antelope AUM allocations would not be available because of wldlife AUM allocation shortages.

Conclusion

The predicted 7,894 AUM shortage would prevent the deer herd from increasing to the UDWR desired levels. The 17 known sage grouse populations would decline. Nongame species would decline in diversity and population size.

Impacts to Fishery Habitat

Since this alternative would allow the continued level of livestock grazing on public land, there would be no positive change in aquatic/riparian and fisheries habitat on the 35.5 miles of stream. Continued livestock use would lead to a further downward trend (from the existing situation, Chapter 2) in habitat as well as fish populations. Stream habitat identified for the sensitive Bonneville (Utah) cutthroat reintroductions would continue in poor condition thereby negating future transplant by UDWR and BLM.

Negative impacts to all streams would occur; the elimination of riparian vegetation, streambank soil erosion, streambank sedimentation, pool quality, and water quality deterioration would result. In addition, a reduction in the level of existing fish populations would be expected.

Generally, the condition of aquatic habitats would shift from fair to poor condition. The exceptions would be the 0.5 mile of habitat contained in the Big Creek exclosure which would remain in good condition and approximately 0.5 mile of habitat on several streams where the headwaters are physically restricted to livestock use (steep canyons, rough terrain) which would remain in fair condition.

Conclusion

Impacts to aquatic/riparian habitat resulting from this alternative would be 0.5 mile remaining in fair condition, and 34.5 miles in poor condition. Of the total 34.5 miles in poor condition, 27 miles are presently in poor condition and 7.5 miles would decline from fair to poor condition as a result of continued livestock use. The Big Creek exclosure would remain in good condition.

Impacts to Archaeological and Historical Resources

Archaeological and historical resources would continue to be degraded by ongoing livestock-related surface disturbance, erosion, and natural deterioration.

Impacts to Visual Resources

In riparian zones, meadows would continue to be trampled to bare ground in many places, and streambank sloughing would continue. Since most streams have already lost the vegetation (visual) characteristics of streamsides and often appear to be simply sagebrush dominated valleys, little change would be expected. The rest of the unit already appears to be a monotype sagebrush prairie, lacking the former natural diversity of grass, shrubs, forbs, brush, and, in places, trees. This condition would be expected to continue.

Impacts to Recreation

The continuation of existing livestock grazing levels would reduce the sport fishing potential of all streams in the unit. Recreation-related wildlife values (fishing; wildlife viewing) would continue to be degraded by livestock concentration in riparian zones.

Impacts to Natural Values

Natural values would continue to be degraded by present livestock grazing practices. The proposed Laketown Canyon ACEC area would not be managed for preservation and enhancement of scenic and natural values under existing conditions.

Impacts to Local Social and Cultural Values

The no action alternative would primarily be an indefinite extension of current conditions and trends into the future. Within the livestock industry, some indicated trends are:

1. The average age of operators is rising, indicating that younger age groups are not entering the industry. This is also seen in the general county-wide population age distribution where the young adult age class appears to be underrepresented in the general population, suggesting out-migration from the county.

2. Employment in local governments has been steadily rising in recent years without equivalent increases in population, suggesting that individuals may be leaving such industries as ranching to either supplement their incomes or leave the business altogether for more substantial income with State or county employment.

3. Raises in costs to ranchers have substantially outstripped any increases in revenues which they have received in recent years, indicating a high financial stress in the industry.

Conclusion

All of these trends combine to suggest the following scenario for the foreseeable future in Rich County:

1. Many current operators may continue their operations until they retire and then sell out rather than pass the operation on within the family.

2. Some operators may leave the industry before retirement age to seek other employment.

3. There may be an expansion of the large scale ranch class as, presumably, this group buys out the holdings of the smaller operators to form larger, more economically viable units.

4. The local economy would remain relatively sluggish (in the absence of any new industry) and would not be expected to show any substantial growth.

5. In the absence of local employment opportunites, a substantial segment of the young adult age group, 18 to 25 years, can be expected to leave the region for employment elsewhere.

These analyses paint a relatively austere picture for the future of Rich County in general and many of its stockmen in specific. There is, however, little evidence to the contrary. Existing socio/cultural values and the livestock-based lifestyle of county residents would continue. The feeling of self-reliance and independence would prevail.

ALTERNATIVE 5 - INCREASED LIVESTOCK GRAZING

DESCRIPTION

This alternative would increase the level of livestock grazing over the initial and long-term management proposal as outlined in Chapter 1. No Management Framework Plan constraints such as forage allowances for wildlife, recreation, or fisheries would be made. Elimination of these constraints and how this would increase the livestock forage allocation to 30,065 AUMs are shown on table 8-21. Proposed deer forage allocation of 8,988 AUMs is also shown on table 8-21.

Livestock turn-on date for this alternative would be determined on the basis of range readiness as outlined in Chapter 1 and modified in Alternative 3. Turn-off would be the same as proposed in Chapter 1. Proposed grazing and resting treatments would be similar to those discussed in Chapter 1 and Appendix 5. No additional full rest treatment for wildlife would be required for the Dry Basin Pasture in Woodruff Pastures Allotment because no interseeding is proposed.

This alternative would be similar to the proposed action in terms of having both the initial and long-term management components and implementation schedule. The only exception would be that the Session and Middle Ridge Allotments would not be proposed for disposal and would be managed similar to Eastman, Deseret, and South Woodruff Allotments where initial action management (no improvements) is proposed to continue in the long term. There would be no recreation site development.

Proposed vegetation treatments would involve 58,440 acres (shown by allotment in table 8-21) and would cost approximately $409,080. Vegetation on poor livestock forage condition ranges would be sprayed or burned as proposed in Chapter 1; drill seeding of desirable livestock forage species would follow. Vegetation on good and fair condition areas would only be sprayed with no follow-up seeding, leaving plant establishment to natural revegetation processes. These treatments are shown on table 8-21.

TABLE 8-21

Alternative 5: Livestock and Wildlife Forage Allocation and Proposed Vegetation Treatment

Allotment	Acres Treated			Initial Stocking AUMs		AUM Increase[a]		Full Implementation AUMs	
	Total	Spray	Burn	Livestock	Deer	Livestock	Deer[b]	Livestock	Deer
Bear Lake	448	448	0	156	184	39	5	195	189
Big Creek	12,421	11,613	808	3,239	1,093	1,446	134	4,685	1,227
Deseret	0	0	0	3,100	738	0	0	3,100	738
Dry Basin	2,764	2,764	0	510	134	251	30	761	164
Duck Creek	8,731	8,382	349	1,777	522	1,138	93	2,915	615
Eastman	0	0	0	628	224	0	0	628	224
East Woodruff	991	991	0	179	125	162	11	341	136
Kearl	398	398	0	176	55	34	4	210	59
Laketown	695	684	11	319	229	93	8	412	237
Meachum Canyon	1,110	1,110	0	393	117	105	12	498	129
Middle Ridge	0	0	0	202	0	0	0	202	0
New Canyon	11,090	11,035	55	4,975	1,556	1,994	119	6,969	1,675
Rabbit Creek	2,247	2,247	0	486	156	207	24	693	180
Sage Creek	6,150	6,058	92	1,048	388	688	66	1,736	454
Session	0	0	0	40	0	0	0	40	0
South Woodruff	0	0	0	314	487	0	0	314	487
Stuart	713	588	125	60	115	120	7	180	122
Twin Peaks	848	848	0	345	87	83	9	428	06
Woodruff Pastures	9,834	9,195	639	4,825	2,151	933	105	5,758	2,256
TOTAL	58,440	56,361	2,079	22,772	8,361	7,293	627	30,065	8,988

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[a] AUM increase includes additional forage from vegetation treatments, water developments, and improved range management.

[b] Additional deer AUMs available only after livestock seedings mature (estimated at 15 to 20 years).

IMPACT ANALYSIS

Impacts to Soil Erosion

As a result of successful seedings, erosion would be reduced on 2,287 acres. Erosion would be increased on 103,785 acres as a result of unsuccessful seedings and increased intensity of use. No significant change would occur to 34,226 acres as proposed vegetation treatment and management would not result in increased ground cover.

The existing critical erosion condition would remain unchanged for areas within the South Woodruff, Deseret, and Eastman Allotments because no vegetation treatments are proposed and the grazing intensities would not change appreciably. Critical erosion areas within the New Canyon Allotment would be subject to increased erosion due to increases in grazing intensity. The additional livestock use proposed would increase streambank sloughing. The downward erosion trends for the Stuart, Big Creek, and Woodruff Pastures Allotments would increase. The present downward erosion trend in the Rabbit Creek Allotment would remain unchanged.

Table 8-22 provides a summary of the anticipated impacts by allotment.

Conclusion

Erosion would be reduced on 2,287 acres, increased on 103,785 acres, and remain unchanged on 34,226 acres.

Impacts to Vegetation

This alternative would improve existing resource conditions. However, competition for available forage between livestock and wildlife would reduce the positive benefits proposed in this alternative.

The range readiness turn-on would improve the vigor, condition, and trend of livestock forage. Food manufacture and storage would improve and vegetation production would increase over existing levels. Range readiness turn-on would benefit all forage with perennial grasses receiving the greatest benefit.

TABLE 8-22

Alternative 5: Erosion Projection

Allotment	Present Erosion Condition	Erosion Acres		
		Less	No Change	More
Bear Lake	Fair	.....	......	1,198
Big Creek	Fair	888	......	19,458
Deseret	Poor	.....	15,557	......
Dry Basin	Good	.....	2,769	12
Duck Creek	Fair	384	......	13,026
Eastman	Poor	.....	3,405	......
East Woodruff	Fair	.....	......	2,167
Kearl	Good	.....	1,176	7
Laketown	Good	12	......	3,229
Meachum Canyon	Poor	.....	......	1,951
Middle Ridge	Good	.....	1,286	......
New Canyon	Poor	60	......	30,605
Rabbit Creek	Good	.....	3,252	5
Sage Creek	Good	102	......	10,051
Session	Fair	.....	238	......
South Woodruff	Poor	.....	4,251	......
Stuart	Good	138	......	904
Twin Peaks	Good	.....	2,292	......
Woodruff Pastures	Fair	703	......	21,172
TOTAL		2,287	34,226	103,785

Proposed grazing/resting treatments (discussed in detail in Appendix 5) would also improve vegetation resources. Additional rest during the growing season would be provided. This would enhance forage production and seedling establishment. Impacts to vegetation from grazing and resting treatments are discussed in more detail in Chapter 3 Vegetation.

Competition for available forage between livestock and deer would continue because a limited deer forage allowance has been proposed. Essentially, this allowance consists of forage not utilized by livestock and, therefore, would be of poor quality consisting largely of intermediate and low-quality shrubs such as big sagebrush. Initially, increased utilization of forage would reduce condition, trend, and production. The principal vegetation species most affected would be desirable shrubs because this alternative proposes actions which favor livestock forage species (grasses). However, shrub availability on seedings would increase over time, as a result of natural plant succession toward a shrub-dominated community. This would result in more forage available to deer.

Overall, these conditions would result in the existing conditions and trends being maintained on these five allotments:

Big Creek
Duck Creek
New Canyon
Sage Creek
Woodruff Pastures

Existing conditions and trends on Eastman and South Woodruff Allotments would decline due to the overstocking by wildlife and livestock.

Existing vegetation conditions and trends would be maintained and improve slightly on 12 allotments:

Deseret
Middle Ridge
Session
Bear Lake
Dry Basin
East Woodruff
Kearl
Laketown
Meachum Canyon
Rabbit Creek
Stuart
Twin Peaks

Vegetation production would increase over existing levels. However, the initial stocking level proposed (22,772 AUMs) would not be reached. It is estimated that the competition between deer and livestock would result in a 10-percent reduction (93 AUMs) in the proposed initial stocking level on Eastman and South Woodruff Allotments or a total of 22,678 AUMs being available to livestock (table 8-23).

The amount of forage proposed from vegetation treatments (7,293 AUMs), would not be fully realized due to continued livestock and deer competition. A reduction of 20 percent or a total of 5,833 AUMs would be realized from vegetation treatments. Total livestock forage available from this alternative would be 28,511 AUMs.

Table 8-23 identifies the level of livestock forage produced and available by this alternative. Table 8-24 summarizes impacts to vegetation.

Conclusion

Existing livestock forage condition would be maintained under this alternative. Livestock forage production would, however, be increased to 28,511 AUMs.

Impacts to Surface Water Quality

By increasing the level of livestock grazing, trampling and compaction would increase causing additional runoff. This would result in increased sedimentation of streams and decreased water quality.

The possibility of livestock turn-on dates after June 1 would offer a chance of greater plant stability and root growth. This would reduce runoff and improve water quality. The magnitude of this impact is not measurable.

Vegetation treatments in or adjacent to stream riparian areas would increase the runoff and, therefore, stream sedimentation during the period of burning or spraying and seeding establishment. This would result in decreased water quality.

Conclusion

Management actions in the following allotments that either have or affect the water bodies and streams in the Randolph ES area would contribute to reduced water quality:

TABLE 8-23

Alternative 5: Predicted Impacts to Livestock Forage Production

Allotment	Initial Stocking Level - Forage Available (AUMs)	Additional Forage Available - This Alternative	Total Available Forage Upon Full Implementation AUMs
Bear Lake	156	31	187
Big Creek	3,239	1,157	4,396
Deseret	3,100	0	3,100
Dry Basin	510	201	711
Duck Creek	1,777	910	2,687
Eastman	565	0	565
East Woodruff	179	130	309
Kearl	176	27	203
Laketown	319	74	393
Meachum Canyon	393	84	477
Middle Ridge	202	0	202
New Canyon	4,975	1,595	6,570
Rabbit Creek	486	166	652
Sage Creek	1,048	550	1,598
Session	40	0	40
South Woodruff	283	0	283
Stuart	60	96	156
Twin Peaks	345	66	411
Woodruff Pastures	4,825	746	5,571
TOTALS	22,678	5,833	28,511

TABLE 8-24

Alternative 5: Summary of Impacts to Vegetation

Allotments	Livestock Forage Condition (acres)		Apparent Trend (acres)		Desirable Plant Vigor		Percent Utilization of Key Species	Composition and Density (acreage)
	EXISTING							
Bear Lake, Dry Basin, East Woodruff, Kearl, Laketown, Meachum Canyon, Rabbit Creek, Stuart, Twin Peaks, Deseret, Middle Ridge, Session (36,193 total acres)	Good	15,895	Up	7,469	Good	6,478	40	See Total
	Fair	17,364	Down	10,548	Fair	28,673		
	Poor	720	Static	15,962	Poor	1,042		
	Unsuitable	2,214	Unsuitable	2,214				
	ALTERNATIVE							
	Good	16,138	Up	8,021	Good	28,143	55	See Total
	Fair	17,841	Down	13,885	Fair	8,050		
	Poor	0	Static	12,073	Poor	0		
	Unsuitable	2,214	Unsuitable	2,214				
	EXISTING							
Big Creek, Duck Creek, New Canyon, Sage Creek, Woodruff Pastures (96,449 total acres)	Good	36,108	Up	2,503	Fair	76,103	60	See Total
	Fair	47,060	Down	27,450	Poor	20,346		
	Poor	3,835	Static	57,050				
	Unsuitable	9,446	Unsuitable	9,446				
	ALTERNATIVE							
	Good	36,108	Up	2,503	Fair	76,103	60	See Total
	Fair	47,060	Down	27,450	Poor	20,346		
	Poor	3,835	Static	57,050				
	Unsuitable	9,446	Unsuitable	9,446				

(continued)

TABLE 8-24 (concluded)

Allotments	Livestock Forage Condition (acres)		Apparent Trend (acres)		Desirable Plant Vigor		Percent Utilization of Key Species	Composition and Density (acreage)	
	EXISTING								
Eastman, South Woodruff (7,656 total acres)	Good	243	Up	552	Fair	7,656	67	See Total	
	Fair	4,448	Down	3,889					
	Poor	2,549	Static	2,799					
	Unsuitable	416	Unsuitable	416					
	ALTERNATIVE								
	Good	0	Up	0	Poor	7,656	60	See Total	
	Fair	3,971	Down	552					
	Poor	3,269	Static	6,688					
	Unsuitable	416	Unsuitable	416					
	* *								
TOTAL EXISTING	Good	52,246	Up	10,524	Good	6,478	55	Density	37
	Fair	68,872	Down	41,887	Fair	112,432		Grass	24
	Poor	7,104	Static	75,811	Poor	21,388		Forb	11
	Unsuitable	12,076	Unsuitable	12,076				Shrub	65
TOTAL ALTERNATIVE	Good	52,246	Up	10,524	Good	28,143	60	Density	37
	Fair	68,872	Down	41,887	Fair	84,153		Grass	35
	Poor	7,104	Static	75,811	Poor	28,002		Forb	10
	Unsuitable	12,076	Unsuitable	12,076				Shrub	55

Bear Lake
Big Creek
Deseret
Dry Basin
Duck Creek
Eastman
Laketown
Kearl
Meachum Canyon
Middle Ridge
New Canyon
Rabbit Creek
Sage Creek
South Woodruff
Twin Peaks
Woodruff Pastures

Impacts to Wildlife

Maximizing livestock grazing by the methods outlined in this alternative would produce the following impacts to wildlife habitat.

The proposed forage allocation method as outlined in Appendix 2 would also be used to allocate forage in this alternative. Livestock would be assigned the total allowable use on deer forage and deer would continue to graze heavily on these species. These preferred deer forage species would decline and new shortages would occur. Additionally, no forage would be allocated to provide for future expansion of deer herds, resulting in shortages of 5,082 AUMs on seasonal ranges and 2,186 AUMs on critical deer winter ranges. Eliminating the Dry Basin Pasture interseeding would mean a loss of a potential 240 high quality AUMs on an existing very poor condition critical deer winter range.

The proposed spraying and burning treatments would be designed to remove the existing wildlife cover and forage on 58,440 acres. These acres would include seven sage grouse strutting grounds, eight sage grouse complexes, and 14,048 acres (84 percent) of the critical deer winter range within the planning unit. The sage grouse populations would abandon the treated areas and the deer herds would suffer starvation and population declines.

Vegetation treatments would produce immediate deer forage shortages on 58,440 acres which would last for 3 years or longer. Deer would overuse the untreated areas, desirable forage would decline, and malnutrition and starvation would occur. As the seeding established, the forage would return to 54 percent of the pretreatment levels, but the overuse of preferred forage and malnutrition would continue. If the seedings are allowed to develop up to 50 percent or more shrub component as a result of natural plant succession (estimated to be 15 to 20 years), this would provide wildlife in the long term with an estimated 627 medium quality competitive AUMs over pretreatment levels. However, this would provide no noticeable relief in the long-term forage shortages.

The proposed season of use would allow late fall and early winter forage competition between deer and livestock on 13,936 acres of poor condition critical deer winter range to continue. This season would also produce late spring and summer forage competition between livestock and sage grouse on all sage grouse complexes. Proposed forage allocation for deer under this alternative and projected shortages are shown on table 8-25.

Of the total 35.5 miles of riparian habitat, 35 miles would not be protected from the vegetation treatments. Treatments would remove the important riparian habitat which supports the majority of the wildlife species within the planning unit (Wildlife Chapter 3). Any opportunities to improve the 35 stream miles (1,031 acres) of riparian habitat would be lost by this alternative.

Range improvements such as fences and water developments would increase cattle distribution into areas not previously used by livestock. This could subject additional wildlife habitat to forage and spatial competition from livestock. Overall, these impacts may be reduced since competition on existing grazed areas would be less intense.

Conclusion

The proposed antelope forage allocation would not be available because of deer forage shortages. Increased competition between livestock and deer would result in the utilization of forage species allocated to antelope. Under this alternative, the populations of deer, sage grouse, and most nongame species would decline.

Impacts to Fishery Habitat

Condition of aquatic/riparian habitats would deteriorate as a result of increased sedimentation, increased streambank sloughing, and a further reduction in streambank cover. Specific impacts are discussed in more detail in Chapter 3 and Appendix 19. Negative impacts resulting

TABLE 8-25

Alternative 5: Long-Term Deer AUM Levels

	Seasonal			Critical Deer Winter Range		
Allotment	Available	Demand	Shortfall	Available	Demand	Shortfall
Bear Lake	......	......	......	189	217	28
Big Creek	1,086	1,646	560	141	227	86
Deseret	......	......	......	738	68	0
Dry Basin	164	564	400	......	......	......
Duck Creek	615	678	63	......	......	......
Eastman	156	330	174	68	150	82
East Woodruff	136	518	386	......	......	......
Kearl	59	235	176	......	......	......
Laketown	116	188	72	121	184	63
Meachum Canyon	96	186	90	33	67	34
Middle Ridge	......	251	251	......	......	......
New Canyon	1,675	2,622	947	......	......	......
Rabbit Creek	180	395	215	......	......	......
Sage Creek	454	1,254	800	......	......	......
Session	......	40	40	......	......	......
South Woodruff	190	414	224	297	646	349
Stuart	......	......	......	122	255	133
Twin Peaks	96	461	365	......	......	......
Woodruff Pastures	963	1,286	323	1,293	2,704	1,411
TOTALS	5,986	11,068	5,082	3,002	4,518	2,186

from this alternative would make any future reintroduction of the sensitive Bonneville (Utah) cutthroat trout infeasible. The present potentially suitable habitat (14.75 miles) would deteriorate.

Conclusion

As a result of this alternative, the following impacts to aquatic/riparian habitat would occur: 0.5 mile would remain in good condition, 0.5 mile would remain in fair, and 34.5 miles would be in poor condition. This 34.5 miles would contain 27 miles that remain in poor condition and 7.5 miles that decline from fair to poor condition.

Impacts to Archaeological and Historical Resources

Any existing deterioration of cultural resources would continue and may increase to some extent.

Impacts to Visual Resources

Increased livestock grazing would cause damage to riparian zones in the form of sloughing banks, trampled areas, and destruction of larger areas of riparian vegetation and meadows where grass has been heavily utilized.

Lack of vegetation variety in proposed land treatments would also provide little visual variety, a desirable factor in scenic quality.

Impacts to Recreation

Increasing livestock grazing would impact existing recreation resource values. Streams would be directly impacted by increased intensity of livestock grazing and vegetation treatments immediately in and adjacent to riparian habitats. This would result in deterioration of aquatic/riparan habitats and their existing fish populations. Fishing opportunities would continue to decline in these streams.

Direct and indirect competition between livestock and wildlife (particularly mule deer, sage grouse, and riparian-oriented wildlife) would increase causing further reductions in all wildlife-related recreational opportunities and values (sightseeing, wildlife viewing and hunting).

Impacts to Natural Values

Natural and scenic values in the proposed Laketown Canyon ACEC would be degraded through increased livestock grazing of the slopes, concentration along the streamsides and vegetation treatments.

Impacts to Rancher Incomes

This alternative has two time elements - initial action and full implementation. The average effect of the initial action component would be a 3-percent decrease in AUM stocking levels for the small scale ranch, a 1-percent reduction for the medium scale, and a 3-percent increase in stocking for the large scale ranch. When these figures are prorated for seasonal dependency on BLM, they are generally less than ±1 percent, which is considered to be insignificant and has not been analyzed further.

The long-term component of this alternative would result in a potential increase over existing stocking levels of 34 percent for the average small scale operator, 37 percent for the medium scale, and 39 percent for the large scale. Prorated for seasonal dependency, these figures become 14, 9, and 13 percent, respectively. The potential effects which these increases would have on the ranch budgets are shown in table 8-26.

Analysis of the income effects of increases in stocking levels assumes that the various ranch enterprises would be capable of utilizing the full extent of the increases. As such, the direct gross income effect of this alternative within the county would be around $360,000.

Small Scale	$ 1,290	x	37	=	$ 47,730
Medium Scale	3,300	x	33	=	108,900
Large Scale	14,276	x	14	=	199,864
TOTAL					$356,494

Impacts to Local Values and Attitudes

It is not anticipated that there would be a measurable impact to county-wide employment levels. This alternative would be highly

TABLE 8-26

Alternative 5: Effects of Increased Livestock Use

	Small Scale		Medium Scale		Large Scale	
	Existing Situation	With Alternative 5 Full Term	Existing Situation	With Alternative 5 Full Term	Existing Situation	With Alternative 5 Full Term
Average number head	65	74	283	308	536	606
AUMs	1,022	1,165	3,530	3,848	7,637	8,630
Average gross income	$9,218.00	$10,508.00	$36,667.00	$39,967.00	$109,818.00	$124,094.00
Average fixed costs	4,998.00	4,998.00	23,816.00	23,816.00	48,820.00	48,820.00
Average variable costs	2,793.00	3,184.00	23,764.00	25,903.00	17,768.00	20,078.00
Average net income	1,427.00	2,326.00	(-10,903.00)	(-9,752.00)	43,230.00	55,196.00
Net income per AUM	1.40	2.00	(-3.09)	(-2.80)	5.66	6.40
Break-even point	$7,171.00	$7,171.00	$67,645.00	$67,680.00	$58,243.00	$58,243.00
Seasonal dependence (percent)	42	....	24	....	34	....

beneficial to the Rich County livestock industry in financial terms. Both gross and net incomes would rise substantially. Employment could rise somewhat, but probably not to a substantial degree due to the employment makeup of the livestock industry. Attitudes of livestockmen would be positive; they would likely perceive this alternative as a preservation of their lifestyle and values.

Conclusion

Long-term management elements of this alternative would yield a moderate economic infusion to the stockmen using BLM lands. However, major county-wide impacts to income, employment, or lifestyles would not be anticipated.

The following table compares impacts for each of the five alternatives and the proposed action:

TABLE 8-27

Comparison of Impacts for Alternatives and Proposed Action

Existing Condition	Proposed Action		Eliminate Grazing		Restricted Livestock Use		Selected Reduced Impacts		No Action		Maximize Grazing	
SOILS												
Erosion (Acres)												
14,265	Reduced	37,734	Reduced	41,046	Reduced	41,047	Reduced	47,732	Reduced	14,265	Reduced	2,287
89,207	No Change	96,741	No Change	0	No change	96,555	No change	81,801	No change	89,207	No change	34,226
34,296	Increase	506	Increase	96,634	Increase	78	Increase	8,147	Increase	34,296	Increase	103,785
2,530	Unknown	5,317	Unknown	2,618	Unknown	2,618	Unknown	2,618	Unknown	2,530		
VEGETATION												
Livestock Forage Condition (Acres)												
52,246	Good	49,207	Good	51,832	Good	51,832	Good	80,687	Good	10,524	Good	52,246
68,872	Fair	69,848	Fair	67,223	Fair	67,223	Fair	40,431	Fair	75,811	Fair	68,872
7,104	Poor	6,549	Poor	6,549	Poor	6,549	Poor	4,486	Poor	41,887	Poor	7,104
12,076	Unsuitable	12,076	Unsuitable	12,076	Unsuitable	12,076	Unsuitable	12,076	Unsuitable	12,076	Unsuitable	12,076
	Unknown	2,618	Unknown	2,618	Unknown	2,618	Unknown	2,618				
Apparent Trend (Acres)												
10,524	Up	70,342	Up	84,153	Up	65,484	Up	70,342	Up	10,524	Up	10,524
75,811	Static	49,723	Static	41,451	Static	58,443	Static	55,262	Static	75,811	Static	75,811
41,887	Down	5,539	Down	0	Down	1,677	Down	0	Down	41,887	Down	41,887
12,076	Unsuitable	12,076	Unsuitable	12,076	Unsuitable	12,076	Unsuitable	12,076	Unsuitable	12,076	Unsuitable	12,076
	Unknown	2,618	Unknown	2,618	Unknown	2,618	Unknown	2,618				
Desirable Vigor (Acres)												
6,478	Good	6,478	Good	137,680	Good	94,006	Good	93,670	Good	23,471	Good	28,143
112,432	Fair	110,135	Fair	0	Fair	43,674	Fair	44,010	Fair	6,276	Fair	84,153
21,388	Poor	21,067	Poor	0	Poor	0	Poor	0	Poor	110,551	Poor	28,002
	Unknown	2,618	Unknown	2,618	Unknown	2,618	Unknown	2,618				
Total Livestock and Wildlife Utilization of Key Species (Percent)												
12 to 74		50		20		22 to 30		50		15 to 75		>70
Density (Percent)												
29 to 52		38 to 40		37		37		40		40		37

(continued)

TABLE 8-27 (continued)

Existing Condition		Proposed Action		Eliminate Grazing		Restricted Livestock Use		Selected Reduced Impacts		No Action		Maximize Grazing	
VEGETATION (concluded)													
Composition (Percent)													
	30	Grass	40	Grass	28	Grass	25	Grass	40	Grass	30	Grass	35
	10	Forbs	10	Forbs	11	Forbs	11	Forbs	8	Forbs	10	Forbs	10
	60	Shrubs	50	Shrubs	61	Shrubs	64	Shrubs	52	Shrubs	60	Shrubs	55
Available Livestock Forage (AUMs)													
	22,776		25,396		0		12,809		22,808		22,187		28,511
WATER													
Runoff (Allotments)													
Increasing	19	Increased	15	Reduced	16	Reduced	10	Reduced	14	Increased	19	Increased	16
				No change	3	No change	9	No change	5			No change	3
Sedimentation (Allotments)													
Declining	10	Reduced	4	Reduced	16	Reduced	10	Reduced	14	Increased	19	Increased	16
Static	1	Increased	15	No change	3	No change	9	No change	5			No change	3
Improving	6												
NA	2												
Streambank Condition (Miles)													
Good	0.5	Improved	8	Improved	35	Improved	33.75	Improved	17	Reduced	35	Reduced	35
Fair	8.0	Reduced	27.5					No change	16.75				
Poor	27.0												
Water Quality (Allotments)													
Declining	19	Reduced	15	Improved	16	Improved	10	Improved	14	Reduced	19	Reduced	16
		Increased	4	No change	3	No change	9	No change	5			No change	3
WILDLIFE													
Sage Grouse (Complexes)													
	9	Fair	6	Fair	..	Fair	11	Fair	17	Fair	..	Fair	..
	..	Good	..	Good	17	Good	6	Good	..	Good	..	Good	..
	8	Poor	11	Poor	..	Poor	..	Poor	..	Poor	17	Poor	17
Deer Forage Allocations (AUMs)													
	8,435	Available	27,487	Available	40,508	Available	36,782	Available	16,119	Available	27,482	Available	8,988
Shortages													
	78	Seasonal	3,097	Season	475	Season	3,058	Seasonal	2,630	Seasonal	5,602	Seasonal	5,082
		CDWR[a]	1,955	CDWR	56	CDWR	1,789	CDWR	652	CDWR	2,292	CDWR	2,186

[a] Critical Deer Winter Range

(continued)

TABLE 8-27 (continued)

Existing Condition		Proposed Action		Eliminate Grazing		Restricted Livestock Use		Selected Reduced Impacts		No Action		Maximize Grazing	
Critical Deer Winter Range Condition (Acres)													
	14,856	Poor	14,856	Poor	......	Poor	......	Poor	......	Poor	14,856	Poor	14,856
	......	Fair	.....	Fair	14,856	Fair	14,856	Fair	14,856	Fair	......	Fair	......
	1,944	Good	1,944	Good	1,944	Good	1,944	Good	1,944	Good	1,944	Good	1,944
FISHERIES													
Aquatic Habitat Condition (Miles)													
	....	Excellent	3.0	Excellent	13	Excellent	13	Excellent	7.25	Excellent	...	Excellent	.....
	0.5	Good	5.45	Good	4	Good	4	Good	9.75	Good	0.5	Good	0.5
	8.0	Fair	3.5	Fair	18.5	Fair	16.5	Fair	2.75	Fair	0.5	Fair	0.5
	27.0	Poor	23.55	Poor	....	Poor	....	Poor	15.75	Poor	34.5	Poor	34.5
Riparian Habitat (Miles)													
Good	0.5	Improved	8.5	Improved	35.5	Improved	33.75	Improved	16.5	Improved	0.5	Improved	0.5
Fair	8.0	Reduced	27.0	Reduced	....	Reduced	1.75	Reduced	17.0	Reduced	35.0	Reduced	35.0
Poor	27.0												
RECREATION													
Fishing and Hunting Opportunities													
Low quality fishing		Increased Fishing		Improved (both)		Improved (both)		Improved (both)		Reduced (both)		Reduced (both)	
Fair deer hunting		Reduced Hunting											
Camping (Opportunities and Quality)													
Poor quality		Small Increase		Improved		No change		Improved		Reduced		Reduced	
CULTURAL RESOURCE													
Cultural Resource Sites													
Moderate site disturbance and artifact loss		No change		Reduced erosional and trampling damage		Reduced erosional and trampling damage		Reduced erosion and trampling damage		Increased disturbance and artifact loss		Increased disturbance and artifact loss	
VISUAL RESOURCES													
Scenic Quality (Quality and Diversity)													
Uninterrupted sagebrush prarie with narrow riparian corridors		Alterations of scenery No change overall in quality		Improved quality and increased diversity		Improved quality and increased diversity		Improved quality and increased diversity		Reduced quality and diversity		Reduced quality and diversity	

(continue

TABLE 8-27 (concluded)

Existing Condition	Proposed Action	Eliminate Grazing	Restricted Livestock Use	Selected Reduced Impacts	No Action	Maximize Grazing
WILDERNESS						
Natural Values						
Potential ACEC in Laketown Allotment	No change	Increased value	Increased value	Increased value Laketown ACEC	Degraded/loss of ACEC	Loss of Laketown ACEC
SOCIOECONOMICS						
Rancher Net Annual Income						
$ 1,427	Small Scale $3,014	Small Scale -$1,272	Small Scale $348	Small Scale $1,042	Small Scale No Change	Small Scale $2,326
-10,903	Medium Scale -7,198	Medium Scale -14,010	Medium Scale -12,523	Medium Scale -10,903	Medium Scale No Change	Medium Scale -9,752
43,230	Large Scale 71,436	Large Scale 11,933	Large Scale 28,208	Large Scale 37,706	Large Scale No Change	Large Scale 55,196
Social Cultural Values						
Declining ranching and agricultural employment	Disrupt established lifestyles of ranchers	Disrupt established lifestyles of ranchers	Disrupt established lifestyles of ranchers	No change	No change	Improved established lifestyles of ranchers

9

CHAPTER 9

CONSULTATION AND COORDINATION

CHAPTER 9
CONSULTATION AND COORDINATION

INTRODUCTION

The Randolph Draft Environmental Statement was prepared by BLM District and State Office specialists with expertise in range management, climate, air quality, soils, water, vegetation, wildlife, fisheries, recreation, visual and cultural resources, and socioeconomics. Additional expertise was obtained through contracting with the Soil Conservation Service and the State of Utah for additional information on soils and water quality.

Consultation and Coordination in the Preparation of the Proposed Action

At the outset of the planning process, coordination was established between the Salt Lake District and two other BLM districts: the Rock Springs District, Wyoming, and the Idaho Falls District, Idaho. These contacts were made to assure general coordination in the management of adjacent areas of public lands between States. Specific coordination was needed with respect to the Crawford Mountain area managed as part of the Randolph Planning Unit by the Salt Lake District for all resources and land uses except livestock grazing, under the management of the Rock Springs District in Wyoming.

Throughout the planning process, numerous public meetings and workshops were conducted to obtain input from as large a cross section of the public as possible. These gatherings included a public meeting held at the Rich County Court House in May 1977, another held in Ogden on June 9, 1977. Five specific resource-oriented workshops were conducted by the District with concerned individuals in late December and early January of 1977-78 addressing Recreation, Lands, Minerals, Wildlife, Range, and Watershed. Subsequent workshops were held both in Ogden and in Randolph in May and June of 1978, respectively. Participants in these meetings represented a broad spectrum of interests including:

Special Interest Groups

General public
Grazing interests
Off-road vehicle enthusiasts

Local Governments and Commissions

Rich County Commission
Bear Lake Association of Governments
Bear Lake Regional Commission

State Government

Utah Division of Wildlife Resources
Utah Division of State Lands - Forestry and Fire Control
Utah Division of Oil, Gas, and Mining
Utah Department of Transportation

Federal Government

U.S. Department of Agriculture - Forest Service
U.S. Fish and Wildlife Service

Other means of informing and involving the public included news releases which were sent to a large segment of the media, 29 local broadcasting stations, and 21 local newspapers. These releases ranged in subject matter from general announcements of the beginning of the planning process, to dates and places of specific meetings and/or to establish field office hours for improved public participation on a local basis.

Additionally, further contact and coordination was established with the following individuals, groups, and agencies during the planning process:

Special Interest Groups

Randolph Planning Unit livestock permittees
Woodruff Cattlemen's Association
Utah Cattlemen's Association
Utah Wool Growers' Association
Utah Farm Bureau

- Utah Wildlife & Outdoor Recreation Federation
- Utah Audubon Society
- ORV User Groups
- Sierra Club
- Weber County Trails

Local Governments, Commissions and Associations

- Bear Lake Regional Commission
- Bear Lake Association of Governments
- Rich County Commission
- Bear River Resource, Conservation, and Development Executive Council
- Bear River Basin Study, Coordinator
- Bear Lake Investigation Project

State Government and Universities

- Utah State Planning Office
- Utah Division of Wildlife Resources
- Utah Division of Water Resources
- Utah Division of Water Rights
- Utah Water Research Laboratory
- Utah Division of State Lands - Forestry and Fire Control
- Utah Geological and Mineral Survey
- Utah Division of Oil, Gas, and Mining
- Utah Division of Parks and Recreation
- Utah Department of Transportation, District 2
- Utah Outdoor Recreation Agency
- Utah State Historic Preservation Office, Department of Development Services
- Utah Division of Health, Bear Lake District
- Wyoming Game and Fish Department
- Utah State University, Logan, Utah
  - Range Extension Specialist
  - Sociology Department
  - Anthropology Department
  - Geography Department

        - Reference and Extension Library
        - Economic Research Service
        - Cooperative Extension Service
        - College of Natural Resources, Recreation Department

Federal Government

- Bureau of Reclamation
- Department of Agriculture, Forest Service
    - Regional Office, Region 4
    - Wasatch National Forest
    - Logan Ranger District
    - Ogden Ranger District
- Department of Agriculture, Soil Conservation Service
    - Agricultural Stabilization and Conservation Service
    - Logan Office
    - Randolph Office
- U.S. Fish and Wildlife Service
- U.S. Geological Service

Consultation and Coordination in the Preparation and Review of the Draft Environmental Statement

Efforts to maintain contact with and supply information to the various elements of the public were continued from the planning process into the writing of this DES. Such contacts were primarily oriented toward those individuals, groups, and agencies who would be directly concerned with the proposal, including stockmen, recreationists, wildlife concerns, the academic community, and the four Utah Congressional delegates. Representatives from many of the previously mentioned individuals, groups, and agencies were contacted for specific information used in the description and analysis in this environmental statement. These are referenced accordingly in the test.

Additional opportunities for public participation will occur during the 45-day review and comment period following publication of the draft ES. The following will be given an opportunity to review the draft, as well as those individuals, groups, and agencies previously noted above:

Interest Groups

Natural Resources Defense Council

Mr. James Morgan

ISSUE

Friends of the Earth

National Wildlife Federation

American Fisheries Society, Bonneville Chapter

Wilderness Society of America

National Council of Public Land Users

Oregon Environmental Council

Nevada Outdoor Recreation Association

Ada County Fish and Game League

Federal Agencies

Environmental Protection Agency

A public hearing will be scheduled during the review period to provide additional opportunity for comment. Further, copies of the draft statement will be available for public review at the following locations:

Office of Public Affairs
Bureau of Land Management
Interior Building
18th and C Streets NW
Washington, D.C. 20240
Telephone (202) 343-5717

Bureau of Land Management
Salt Lake District Office
2370 South 2300 West
Salt Lake City, Utah 84119
Telephone (801) 524-5348

Bureau of Land Management
Randolph Field Office
Randolph, Utah 84064
Telephone (801) 793-3295
(Thursdays only)

Utah State Office
Bureau of Land Management
University Club Building
135 East South Temple
Salt Lake City, Utah 84111
Telephone (801) 524-4227

Bureau of Land Management
Cedar City District Office
1579 North Main Street
Cedar City, Utah 84720
Telephone (801) 586-2401

REFERENCE MATERIAL

APPENDIX 1

Randolph Planning Unit Land Status Details

Throughout the environmental statement, the title "Randolph Planning Unit" is used to describe the area; however, not all of the public land in the planning unit is involved in the proposed action described in Chapter 1 of the ES. The 30,285 acres in this category are shown in table 1. This appendix provides clarification of the following types of land excluded.

a. Public lands in grazing allotment shared with the adjacent planning unit in Wyoming. These lands are located in the Crawford Mountains. Livestock grazing on the 29,185 acres of public land is administered by the BLM District Office in Rock Sprngs, Wyoming. The Pioneer Trails ES, scheduled for completion in 1985, will include this area.

b. Public lands in very small scattered tracts (usually less than 160 acres) are not presently authorized for livestock grazing. There are no grazing permits issued, and none would be proposed. A total of 1,100 acres of public land are involved.

Forest Service, State, and private lands in the planning unit are also not included in the proposal.

Table 1 summarizes the acres excluded from the Randolph ES by land ownership.

TABLE 1

Land Area in the Randolph Planning Unit Excluded from ES

	Public Land (BLM)	Forest Service	Private	State
Excluded acres in allotments	29,185	...	90,189	16,518
Excluded acres outside allotments	1,100	80	261,013	30,719
Total acres excluded in planning unit	30,285	80	351,202	47,237

APPENDIX 2

BLM Planning System and the Randolph Planning Unit

The following four steps are an integral part of the BLM planning system and were fully utilized during preparation of this ES for the Randolph Planning Unit:

1. Land and Resource Inventory Data are collected on current resource supply and production, condition, and trend. Data have been collected in the following land use categories: lands, minerals, forest products, range management, watershed, wildlife habitat, and recreation. Additional physical data, including topography, climate, geology, soils, vegetation, erosion condition, hazards, developments, and access have been collected. These inventories were completed and updated in 1976 and 1977 for the Randolph PU.

2. Unit Resource Analysis (URA) is a document containing a summary of the resource inventories and describing the physical profile of the unit. It also describes the present situation with respect to current land uses, production, trends, condition, and problems. In addition, it develops technically feasible projections for potential resource enhancement, improvement, and production capability. This document was prepared during 1976 and 1978 for Randolph.

3. Planning Area Analysis (PAA), completed in 1978, is a collection and analysis of socioeconomic data for the unit. It contains economic demand projections for each resource and social value analysis.

4. Management Framework Plan (MFP) is a land use plan that is developed using resource management opportunities identified in the URA, plus socioeconomic data presented in the PAA. It is organized around the seven land use categories (identified in Land and Resource Inventory Section above). The first step in developing the MFP is to protect each resource use independently, taking into account resource capability, technical feasibility, physical limitations, laws, regulations, policy, and demand. Conflicts between existing uses and other potential uses are then identified and described by an interdisciplinary team under the direction of a BLM manager.

Whenever a conflict is encountered, the BLM manager studies the land use options available to him. Based on comparative analysis, the BLM manager selects an option which best meets his management objectives and identifies any trade-offs or compromises made as a result of that selection. Tentative multiple use management recommendations were made for the Randolph Planning Unit in 1978. As public input is collected and analyzed on these tentative recommendations, final multiple use decisions for the unit will be developed. This ES will provide the manager with additional information to consider in the decision-making process.

Land use conflicts in the Randolph unit resulted in a reduction or modification of the range management proposed action. These conflicts were associated with aquatic/riparian management, recreation site development, and public land disposal. Table 1 identifies allotments where these conflicts resulted in a reduction of the acres authorized for livestock grazing.

Conflicts with wildlife habitat management, primarily critical winter ranges for deer, resulted in significant constraints on the proposed action. Although acreages authorized for grazing use were not affected, the proposed level of livestock use (initial action and the long term) was reduced. The season of use was modified on selected allotments in critical deer winter range to reduce competition between deer and livestock for available forage. The projected allocation of the expected forage production resulting from the proposed vegetation treatments favored deer over livestock. It is estimated that the proposed livestock forage allocation (due to these treatments) was 60 percent below the potential forage production for livestock. The proposal would allocate 11,913 AUMs to livestock and 8,819 AUMs to deer when forage becomes available on these treatment areas.

In addition, areas where these vegetation treatments are proposed have been reduced to accommodate sage grouse and riparian habitat needs (Appendix 8, Project Design Specifications).

TABLE 1

Proposed Reduction in Areas Authorized for Livestock Grazing

Allotment	Total Federal Acres	Acre Reduction From			Federal Acres Authorized for Livestock Grazing
		Riparian Management	Recreation Site	Land Action (Disposal)	
Bear Lake	1,198	...	...	80	1,118
Big Creek	20,346	59	...	321	19,966
Deseret	15,557	...	...	190	15,367
Duck Creek	13,410	...	...	160	13,250
Eastman	3,405	...	...	80	3,325
Laketown	3,241	23	...	.....	3,218
Middle Ridge[a]	1,286	...	...	1,286	0
New Canyon	30,665	97	4	214	30,350
Sage Creek	10,153	...	...	25	10,128
Session[a]	238	...	...	238	0
Twin Peaks	2,292	29	...	...	2,263
Woodruff	21,875	...	3	17	21,855
TOTAL	123,666	208	7	2,611	120,840

[a] Reduction in authorized livestock grazing proposed in long-term management.

APPENDIX 3

Evolution of the Proposed Action

MFP 1 Recommendation	Other Resource MFP 1 Recommendations That Conflict with Range	MFP 1 Conflicts	MFP 2 Range Recommendation	Rationale for MFP 2 Recommendation	Trade-Off
INITIAL ACTION. Continue existing livestock management, but make adjustments to maintenance for existing forage production. Allow maximum livestock use consistent with meeting soil and plant requirements.					
A. Determine range suitability on 19 allotments. Consider slope, forage production, distance from water and erosion. Determine grazing capacity and allow grazing on basis of suitable Federal acres. Total Federal acres: 140,298 Suitable for grazing: Cattle 120,271 Sheep 134,571 Potentially suitable: Cattle 7,952 Sheep 2,124 Unsuitable: Cattle 12,075 Sheep 3,603	A. Manage aquatic/riparian habitats for maximum production and quality. Eliminate livestock grazing on 1,031 acres. Provide opportunity for recreation site development in planning unit. Eliminate livestock grazing on 7 acres for construction of three recreation sites in New Canyon and Woodruff Pastures Allotments. Make public land available for sale or exchange. Do not authorize livestock grazing on 1,300 acres proposed for disposal.	A. Management for maximum aquatic/riparian production and quality would require exclusion of livestock from these habitats resulting in a loss of 516 AUMs; extensive fencing would disrupt range management activities, grazing system design and livestock use patterns. A source of water would be eliminated. Recreation site development would not result in a measurable loss of AUMs, but fencing would disrupt livestock management activities. Disposal of public land would eliminate an estimated 380 AUMs that could be available to livestock.	A. Eliminate livestock grazing by fencing select portions of six streams for a total of 208 acres and an estimated 104 AUMs. Do not authorize livestock grazing on 1,087 acres of scattered isolated tracts of public land. Make available for land disposal. Reduce available livestock forage by 318 AUMs. Make public land available for recreation site development. Reduce livestock grazing 7 acres but no AUMs. Allow cattle grazing on 120,271 suitable Federal acres and sheep grazing on 134,571 suitable Federal acres. Reduce livestock AUMs by 422 or allocate 22,350 AUMs.	A. Areas of livestock exclusion were selected on basis of aquatic/riparian production potential. Habitat areas where protection would do most good and result in the greatest benefit were selected. These also correspond to streams with high recreation value. Protect parts of these high value streams now; leave protection of the remaining streams until improved management can be provided. This would afford more flexibility and means of protection. Allow recreation site development to partially fulfill demand for additional recreation opportunity. Management for both recreation and livestock land uses would be less complicated if these sites were fenced to avoid or reduce conflicts. Reduce land disposal acreage. Do not allow disposal of 213 acres of public land that are important critical deer winter range. Land disposal of remaining tracts would not result in significant loss to the range management program.	A. Portions of six streams (8 miles, 208 acres) fenced to exclude livestock. Livestock restraining measures (barriers) would be installed on select portions of remaining riparian habitat. In long term, impacts to riparian habitat would be reduced by incorporating riparian habitat needs into range management objectives. Remaining 275 miles of aquatic/riparian habiitat would not be expected to improve significantly, although livestock restraining measures (barriers) and temporary protection would cause improvement in localized areas. Protective fencing of riparian habitats would reduce available livestock forage by 104 AUMs and 208 acres. Land disposals would result in loss of 318 AUMs and 1,087 acres authorized for livestock grazing.

(continued)

MFP 1 Recommendation	Other Resource MFP 1 Recommendations That Conflict with Range	MFP 1 Conflicts	MFP 2 Range Recommendation	Rationale for MFP 2 Recommendation	Trade-Off
INITIAL ACTION (continued)					
					the range management program would occur as a result of 7 acres recreation site development.
B. Determine available forage and allow maximum level of livestock use consistent with maintaining that level. Total forage available: Cattle 17,820 Sheep 16,672 TOTAL 34,492	B. Same as A. above. In addition, this level of livestock use would conflict with wildlife recommendation to improve condition and quality of critical deer winter range. Increase quality of fishing and recreation experiences on five streams in Randolph Planning Unit (Laketown, Middle Fork Otter Creek, Randolph Creek, Big Creek, and Little Creek). Manage livestock grazing to provide maximum diversity, overhanging streambank vegetation, no evidence of physical damage and water clarity.	B. In addition to above noted conflicts, forage competition between livestock and deer on 10 allotments and for spatial competition on 11 allotments. Conflict with antelope introduction and proposed sheep increase in Sage Creek, Deseret, and Crawford Mountains. Continued degradation of riparian habitat not protected by fencing. Major impacts in New Canyon and Big Creek Allotments. Degradation of water quality, streambank erosion, degraded fishing quality. Lack of sufficient forage on critical winter range for deer. Increased competition on preferred browse plants as well as for space during extreme weather conditions.	B. Allocate forage on basis of following factors: (1) reduce the supply of available forage for livestock to accommodate the above-mentioned multiple use constraints; deduct 422 AUMs; (2) evaluate additional factors that indicate proper level of livestock use. Consider forage inventory, condition, apparent trend, utilization, past active authorized use for each allotment. Also consider wildlife needs, especially on critical deer winter ranges and riparian habitats. Allocate livestock forage on basis of improving condition and quality of wildlife habitat. Do not allow direct competition for forage on critical ranges. For the 19 allotments, allow cattle use on 16 allotments for a total of 17,515 AUMs. Allow sheep use on 10 allotments for a total of 4,835 AUMs. Do not allocate potentially suitable forage until additional water has been developed. Adjust existing levels of livestock use to reflect this allocation. Reduce livestock on 11 allotments, increase use on four allotments and maintain existing level of use on four allotments.	B. Protection of 8 miles of riparian habitat would improve fisheries and recreation quality. Allowing for land disposals would fulfill demand for public land in unit and improve efficient administration of remaining public land. Recreation site development would meet immediate demand for this activity. Total livestock forage allocation of 22,350 AUMs is within available supply. Livestock use at this level would maintain resource productivity and reduce existing livestock land use conflicts. Increases in livestock use would be given immediately. Reductions smaller than 15 percent would also be imposed immediately. Livestock reductions larger than 15 percent would be prorated over a 3-year period. Continue range and wildlife studies on all allotments to determine effectiveness of of these adjustments.	B. 350 AUMs of potential sheep forage and 832 AUMs of potential cattle forage not allocated until water is developed in long term. Continued streambank and water quality degradation in riparian habitats, although less than is presently occurring. Continued forage and spatial competition between deer and livestock, although degree of intensity would be reduced.

(continued)

APPENDIX 3 (continued)

MFP 1 Recommendation	Other Resource MFP 1 Recommendations That Conflict with Range	MFP 1 Conflicts	MFP 2 Range Recommendation	Rationale for MFP 2 Recommendation	Trade-Off
INITIAL ACTION (concluded)					
C. Set season of use as required to meet soil and plant needs and maintain forage productivity. Recommend season that would allow most rapid improvement in condition and trend of livestock forage. Allow cattle grazing between 7/1-10/31; sheep grazing between 7/1-12/31 on all allotments except those that presently have operational grazing systems and AMPs.	C. This would conflict with critical deer winter range management to provide maximum forage and reduce existing level of competition between livestock and deer. Improve water quality and riparian habitat condition. Improve habitat condition for sage grouse.	C. Existing spatial and forage competition between deer and sheep would continue on critical winter ranges during period 10/1-12/31. Key browse species for deer are in poor vigor and are overused. Increased fall sheep use would intensify this problem. Livestock use would continue during fish spawning periods. Riparian habitat, particularly overhanging shrubs would continue to be utilized heavily in the fall. Fall grazing would reduce cover of sagebrush and continue to limit habitat quality for sage grouse. Fixed seasons of use would not allow for varying climatic conditions and may lead to overuse during periods of drought and when forage production is below average due to reduced vigor. In addition, supply of forage would not be utilized at a time when it would provide high nutrition to livestock.	C. Base livestock turn-on date on range readiness. Use bluebunch wheatgrass and crested wheatgrass as key species to indicate when grazing should commence. This would apply to all allotments except those with existing grazing systems. Establish fixed criteria to determine turn-on and evaluate each year. In no case would turn-on be later than 6/1. Determine turn-off individually for each allotment. Consider present forage condition, wildlife needs, and livestock operations.	C. Range readiness would provide flexible turn-on that would correspond to forage production each year. Spring grazing would not begin until forage plants have begun food storage. This would improve vigor and reproduction and reduce conflicts with wildlife. A turn-on of no later than 6/1 would allow livestockmen to adjust operations around this flexibility. It would also provide a source of high quality forage for livestock.	C. Conflicts with riparian habitats and sage grouse would likely continue. However, they would not be intensified in periods of low forage productivity. Fall sheep use would continue to conflict with deer on critical winter ranges. Maximum improvement of these areas would be foregone.
LONG-TERM MANAGEMENT DISPOSAL					
Dispose of 1,524 acres of public land in Session and Middle Ridge Allotments. Eliminate livestock grazing upon disposal.	Disposal of public land would not allow for improvement of deer winter range. Improvement or maintenance of riparian habitats would be foregone on Middle Ridge Allotment.	Management of deer winter range would not be possible. These two allotments do not lie within critical winter ranges for deer. The poor condition riparian habitat on Middle Ridge Allotment could not be managed for improvement. An estimated 1.5 miles on Walton Creek and 2.5 miles on Woodruff Creek would be involved.	Dispose of public land in Middle Ridge and Session Allotments. Eliminate 1,524 acres and 242 AUMs (40 AUMs cattle forage and 202 AUMs sheep forage) of livestock grazing. Manage livestock grazing and other resources under Initial Action until disposal becomes effective. Propose no improved range management for these two allotments.	Elimination of livestock grazing on these two allotments would facilitate range management program in planning unit. Potential for improved management is limited. Long-term administration of these two allotments would be costly. Approximately 65 percent of land in these allotments is intermingled private land.	Allocated livestock forage would be reduced by 242 AUMs. Wildlife forage allocation would be reduced by 131 AUMs. Total mileage of riparian habitat would be reduced by 1.7 miles or less than 5 percent of total 35.5 miles on public land.

(continued)

APPENDIX 3 (continued)

MFP 1 Recommendation	Other Resource MFP 1 Recommendations That Conflict with Range	MFP 1 Conflicts	MFP 2 Range Recommendation	Rationale for MFP 2 Recommendation	Trade-Off
CONTINUE INITIAL ACTION MANAGEMENT					
Propose improved management for 23,213 acres in Deseret, Eastman, and South Woodruff Allotments. Implement grazing systems, construct range developments and undertake vegetation treatment projects to increase available livestock forage. Allocate increased AUMs from improved management to livestock.	Maintenance or improvement of riparian habitat. Improvement in condition and quality of critical winter range for deer. Maintain or improve sage grouse habitat.	Riparian habitat exists in South Woodruff Allotment. About 1 mile of Home Creek would continue to be impacted by livestock. It is already in poor condition, and intensified grazing would not provide opportunity for improvement. All three allotments are within critical winter range for deer. Grazing systems would continue to perpetuate conflicts between deer and livestock. All three allotments are grazed by sheep and cattle. Competition for forage would continue, especially in the fall. Management objectives would not provide for diversity. Vegetation treatments would remove cover and lower habitat quality. Sage grouse habitat in Deseret and South Woodruff Allotments would be impacted by treatment projects proposed. Competition for succulent forage could occur with more intense livestock use.	Do not propose improved management for these allotments. Continue range management under Initial Action. Utilize allotment-wide grazing systems for management to maintain existing resource values. Do not construct range developments or undertake vegetation treatments.	The large amount of private lands in these allotments and checkerboard pattern make large-scale improved management infeasible at this time. Attempt to block up small scattered tracts of public land through land exchange to provide a larger resource base. At that time, improved management would be considered. Existing resource conflicts would be considered. Existing resource conflicts would be intensified by improved management unless more control is gained in management of public land to meet objectives aimed at improving resources.	Management for increased livestock forage productivity would be foregone An estimated 3,331 AUMs of livestock forage would have been available by improved management (grazing systems). An estimated 2,177 AUMs additional forage would have been available to livestock from vegetation treatments. The existing level of deer forage could have produced a desirable composition of deer forage. Wildlife conflicts would continue at the same intensity as present.
IMPLEMENT IMPROVED MANAGEMENT					
A. Implement improved mananagement on 115,561 acres of public land to increase livestock forage and sustain long-term productivity. Construct range developments required to facilitate range management.	This would conflict with maintenance or improvement of riparian habitats. Improvement of condition and quality of forage on critical winter ranges for deer. This would conflict with the wildlife proposal to interseed the Dry Basin Pasture in the Woodruff Pastures Allotment.	Even if periodic rest is provided, reduced streambank stability, water quality and fishery habitat would occur. Project construction near the riparian zone may accelerate erosion and increase sedimentation. Additional rest would not be provided for the successful establishment of desirable shrubs interseeded into the existing grass in the Dry Basin Pasture.	Implement improved management on 14 allotments involving 115,561 acres of public land. Develop grazing and resting treatments that: allow for no pasture to be grazed more than 2 years in a row during early spring period (5/1-6/30) before receiving rest at least one growing season.	This recommendation would allow for improvement of livestock forage conditions and increase supply of forage at a sustained level.	Existing wildlife conflicts may continue but would not be as intense. Condition of riparian habitats would be maintained or improved, but would not reach maximum production and quality.

(continued)

APPENDIX 3 (continued)

MFP 1 Recommendation	Other Resource MFP 1 Recommendations That Conflict with Range	MFP 1 Conflicts	MFP 2 Range Recommendation	Rationale for MFP 2 Recommendation	Trade-Off
LONG-TERM MANAGEMENT - IMPLEMENT IMPROVED MANAGEMENT (continued)					
Develop additional sources of water to increase livestock use of available forage on 7,952 potentially suitable cattle acres and 2,124 acres potentially suitable for sheep. Allocate 1,182 AUMs of available forage on potentially suitable areas.	Protection of cultural resources. Improvement in the condition of sage grouse habitat.	Grazing and resting treatments would intensify conflicts between deer and livestock. Increases in livestock use on critical winter ranges for deer may increase competition for available forage. Range development would restrict wildlife movement and may affect water use. Cultural resources may be impacted by construction of range developments. Habitat quality for sage grouse may be reduced due to increased livestock use. Range development construction during breeding period would result in disturbance.	Provide rest in every pasture until seed ripe (7/31) at least once every 5 years. This would apply to all allotments except Dry Basin Pasture in Woodruff Pastures Allotment. Accommodate wildlife interseeding project and provide for complete rest 2 consecutive years out of 5. Bluebunch wheatgrass and crested wheatgrass will be considered key species for livestock management. Cattle use would terminate when either proper utilization (50 percent) is achieved or ending date for grazing period is reached. Winter sheep use would terminate as scheduled or as soon as there is 60 percent utilization on key species (Putr, Amal, Arno, etc.). Require inventory of cultural resources prior to construction. Fulfill responsibility to protect known values. Restrict location of range developments. Allow no development within riparian habitats and sage grouse breeding complexes; restrict construction activities during breeding period (4/1-6/15). Initial stocking level for each allotment would be same as Initial Action. Continue monitoring and studies. As livestock forage increases, allocate to livestock, providing allotment objectives are being achieved. Modify management objectives to include wildlife needs.	Modification to include wildlife consideration would enhance management objectives to improve condition and production of deer, riparian, and sage grouse habitats. Grazing treatments would provide for periodic rest and allow for plant growth and reproduction needs. Range developments would enhance distribution and utilization of livestock forage.	

(continued)

APPENDIX 3 (continued)

MFP 1 Recommendation	Other Resource MFP 1 Recommendations That Conflict with Range	MFP 1 Conflicts	MFP 2 Range Recommendation	Rationale for MFP 2 Recommendation	Trade-Off
LONG-TERM MANAGEMENT - IMPLEMENT IMPROVED MANAGEMENT (continued)					
			Allocate 38 AUMs of forage when it becomes available. Allocate 1,182 AUMs to livestock when additional water developments are constructed.		
B. Increase amount of desirable livestock forage by removing undesirable species by vegetation treatment (chaining, spraying, and burning). Seed with mixture of desirable forage for livestock. Upon establishment of seeding and increased forage production, allocate an additional 10,856 AUMs to livestock. Treat 4,465 acres of juniper, 99,287 acres of big sagebrush on 19 allotments.	Forestry program to maintain existing production of juniper stands. Maintenance or improvement of water quality and riparian habitat production. Management to improve condition of sage grouse breeding complexes. Management for improved cover for deer on critical winter ranges. Protection of cultural resources. Management to protect and enhance scenic values in Laketown Canyon.	Juniper chaining would destroy 4,465 juniper trees, which are a limited resource in P.U. Juniper also provides cover for deer during winter months. Degradation of water quality and physical condition and production of riparian habitats would occur from treatments near stream areas. Removal of cover in active sage grouse areas would cause disturbance during breeding period and would reduce supply of deer forage. Alteration of plant composition would result in a visual intrusion. Treatment projects may destroy cultural resource values.	Do not allow treatment of big sagebrush in allotments where grazing is proposed for elimination (1,456 acres of big sagebrush). Do not allow treatment in allotments that are to be managed by Initial Action (16,373 acres of big sagebrush). Do not treat 817 acres of big sagebrush on scattered tracts proposed for land disposal and 7 acres involved in recreation site development. Do not allow treatment of sagebrush within 0.5-mile radius of active sage grouse strutting grounds; reduce treatment by 5,222 acres. Do not allow treatment within 0.25-mile of stream riparian habitats or a total buffer strip of 0.5-mile; reduce acreage by 9,925 acres. Total reduction in acres of big sagebrush to be treated on 34,100 acres. Do not allow treatment on 4,465 acres of juniper. Allow treatment by spraying and/or burning followed by seeding on 14 allotments and 65,187 acres of big sagebrush. For 10,106 acres of this total located in winter range for deer, restrict livestock forage allocation. Seed with mixture of desirable species for wildlife and livestock. Target compositions:	Reduction in acreage to be treated would protect riparian habitats from direct disturbance. Wildlife values, especially sage grouse and deer habitat condition would be enhanced. Exclusion of juniper stands and conformance to visual management standards would reduce possible impacts to scenic quality and recreation values. Cover and desirable forage would be improved on critical deer winter ranges. Livestock forage quality and supply would be increased.	Vegetation treatment foregone on 4,465 acres of juniper. Supply of livestock forage reduced 1,488 AUMs. Treatment on big sagebrush foregone on 34,100 acres livestock forage reduced by 11,366 AUMs. Additional reduction in livestock forage (9,817 AUMs) on 65,187 acres of treatment to accommodate target compositions for wildlife.

(continued)

APPENDIX 3 (concluded)

MFP 1 Recommendation	Other Resource MFP 1 Recommendations That Conflict with Range	MFP 1 Conflicts	MFP 2 Range Recommendation	Rationale for MFP 2 Recommendation	Trade-Off
LONG-TERM MANAGEMENT - IMPLEMENT IMPROVED MANAGEMENT (concluded)					
			grass 50 percent forbs 10 percent browse 40 percent 55,081 acres of big sagebrush is deer summer range. Restrict allocation of livestock forage to target compositions: grass 65 percent forbs 10 percent browse 25 percent Reduce total allocation by 22,671 AUMs due to above-mentioned constraints. Allocate a total of 11,913 AUMs to livestock upon establishment of seedings and increased forage availability. Range management objectives should maintain "seeded" species in vegetation community. In addition, design treatment areas to be in conformance with visual resource management criteria. Survey cultural resources and protect values where identified.		

APPENDIX 4

Existing and Proposed Grazing

	LIVESTOCK AND DEER GRAZING SITUATION					INITIAL ACTION		PROBABLE FORAGE ALLOCATION				
								AUMs Available From			Full Implementation of Proposed Action	
Allotment (Total Public Land Acres)	Available Forage AUMs	Present Season of Use	Present Grazing Preference AUMs	Past Active Authorized Use (AUMs)	Estimated Current Deer Use (AUMs)[a]	Initial Allocation (AUMs)	Initial Season of Use[b]	Water Development	Management	Vegetative Treatment	Total AUMs Allocated	Season of Use[c]
DISPOSAL												
Late spring/summer/fall/early winter												
Middle Ridge (1,286)												
Sheep	202	6/1-11/24	112	103	.....	202	6/1-11/24	.....	.....	.....	* * Elimination * *	
Total Livestock	202	....	112	103	.....	202	....	.....	.....	.....	* * Elimination * *	
Deer	405	Seasonal	.....	.....	59	59	....	.....	.....	.....	.....	....
Other Uses[d]	0	....	.....	.....	.....	0	....	.....	.....	.....	202	....
Spring/summer/early fall (RR)												
Session (238)												
Cattle	40	5/16-9/15	40	40	.....	40	RR - 9/30	.....	.....	.....	.....	....
Total Livestock	40	....	40	40	.....	40	....	.....	.....	.....	* * Elimination * *	
Deer	98	Seasonal	.....	.....	14	14	....	.....	.....	.....	.....	....
Other Uses[d]	0	....	.....	.....	.....	0	....	.....	.....	.....	40	....
CONTINUE INITIAL ACTION MANAGEMENT: ALLOTMENT-WIDE GRAZING												
Spring/summer/fall (RR)												
Eastman (3,405)												
Cattle	281	5/1-10/15	696	648	.....	281	RR - 10/15	.....	.....	.....	.....	RR - 10/15
Sheep	331	....	.....	.....	.....	331	RR - 9/30	.....	.....	.....	.....	RR - 9/30
Total Livestock	612	....	696	648	.....	612	....	.....	.....	.....	612	....
Deer	1,111	Seasonal	.....	.....	156	156	....	.....	.....	.....	1,111	....
	198	Critical winter	.....	.....	68	68	....	.....	.....	.....	198	....
Antelope	80	Seasonal	.....	.....	.....	.....	....	.....	.....	.....	80	....
Other Uses[d]	16	....	.....	.....	.....	16	....	.....	.....	.....	16	....
Spring/summer/early fall (RR)												
Deseret (15,557)												
Cattle	1,773	....	.....	.....	.....	1,773	RR - 9/30	.....	.....	.....	.....	RR - 9/30
Sheep	1,289	5/1-12/31	3,100	2,427	.....	1,289	RR - 9/30	.....	.....	.....	.....	RR - 9/30
Total Livestock	3,062	....	3,100	2,427	.....	3,062	....	.....	.....	.....	3,062	....
Deer	2,021	Critical winter	.....	.....	738	738	....	.....	.....	.....	2,021	....
Antelope	140	....	.....	.....	.....	.....	....	.....	.....	.....	140	....
Other Uses[d]	38	....	.....	.....	.....	38	....	.....	.....	.....	38	....
South Woodruff (4,251)												
Cattle	230	5/1-9/30	321	321	.....	230	RR - 9/30	.....	.....	.....	.....	RR - 9/30
Sheep	84	5/1-12/31	84	46	.....	84	RR - 9/30	.....	.....	.....	.....	RR - 9/30
Total Livestock	314	....	405	367	.....	314	....	.....	.....	.....	314	....
Deer	438	Seasonal	.....	.....	190	190	....	.....	.....	.....	438	....
	310	Critical winter	.....	.....	297	297	....	.....	.....	.....	310	....

(continued)

APPENDIX 4 (continued)

	LIVESTOCK AND DEER GRAZING SITUATION					INITIAL ACTION		PROBABLE FORAGE ALLOCATION				
								AUMs Available From			Full Implementation of Proposed Action	
Allotment (Total Public Land Acres)	Available Forage AUMs	Present Season of Use	Present Grazing Preference AUMs	Past Active Authorized Use (AUMs)	Estimated Current Deer Use (AUMs)[a]	Initial Allocation (AUMs)	Initial Season of Use[b]	Water Development	Management	Vegetative Treatment	Total AUMs Allocated	Season of Use[c]
IMPLEMENT IMPROVED MANAGEMENT												
Spring/summer/early fall (RR)												
Bear Lake (1,198)												
Cattle	140	5/10-9/15	187	168	.....	140	RR - 9/30	.....	.....	.....	.....	RR - 9/30
Total Livestock	140	....	187	168	.....	140	....	.....	.....	10	150	....
Deer	427	Critical winter	.....	.....	184	184	....	.....	.....	.....	427	....
Other Uses[d]	16	....	.....	.....	.....	16	....	.....	.....	.....	16	....
Dry Basin (2,781)												
Cattle	510	5/10-7/9	510	471	.....	510	RR - 9/30	.....	.....	.....	.....	RR - 9/30
Total Livestock	510	....	510	471	.....	510	....	.....	.....	104	614	....
Deer	1,176	Seasonal	.....	.....	134	134	....	.....	.....	176	1,352	....
Kearl (1,183)												
Cattle	176	5/10-9/30	503	504	.....	176	RR - 9/30	.....	.....	.....	.....	RR - 9/30
Total Livestock	176	....	503	504	.....	176	....	.....	.....	32	208	....
Deer	425	Seasonal	.....	.....	55	55	....	.....	.....	-100	325	....
Laketown (3,241)												
Cattle	296	5/10-9/30	296	299	.....	296	RR - 9/30	.....	.....	.....	.....	RR - 9/30
Total Livestock	296	....	296	299	.....	296	....	75	.....	4	375	....
Deer	582	Seasonal	.....	.....	112	112	....	.....	.....	.....	582	....
	320	Critical winter	.....	.....	117	117	....	.....	.....	5	325	....
Other Uses[d]	23	....	.....	.....	.....	23	....	.....	.....	.....	23	....
Stuart (1,042)												
Cattle	60	5/16-6/19	102	102	.....	60	5/16-6/19	.....	.....	.....	.....	RR - 9/30
Total Livestock	60	....	102	102	.....	60	....	.....	.....	114	174	....
Deer	293	Critical winter	.....	.....	115	115	....	.....	.....	196	489	....
Spring/summer/early winter (RR)												
Big Creek (20,346)												
Cattle	2,702	5/10-9/30	3,613	3,478	.....	2,702	RR - 9/30	.....	.....	.....	.....	RR - 9/30
Sheep	414	5/10-12/31	430	402	.....	414	RR - 11/30	.....	.....	.....	.....	RR - 11/30
Total Livestock	3,116	....	4,043	3,880	.....	3,116	....	393	.....	2,985	6,494	....
Deer	4,187	Seasonal	.....	.....	969	969	....	.....	.....	2,281	6,468	....
	215	Critical winter	.....	.....	125	125	....	.....	.....	167	382	....
Other Uses[d]	123	....	.....	.....	.....	123	....	.....	.....	.....	123	....
IMPLEMENT IMPROVED MANAGEMENT												
Spring/summer/early fall (RR)												
Duck Creek (13,410)												
Cattle	1,209	5/10-9/30	1,485	1,404	.....	1,209	RR - 10/31	.....	.....	.....	.....	RR - 10/31
Sheep	536	5/10-7/16 10/1-12/9	546	521	.....	536	RR - 12/9	.....	.....	.....	.....	RR - 12/9
Total Livestock	1,745	....	2,031	1,925	.....	1,745	....	.....	.....	2,649	4,394	....
Deer	2,512	Seasonal	.....	.....	522	522	....	.....	.....	123	2,635	....
Antelope	29	....	.....	.....	.....	.....	....	.....	.....	.....	29	....
Other Uses[d]	32	....	.....	.....	.....	32	....	.....	.....	.....	32	....

(continued)

APPENDIX 4 (continued)

	LIVESTOCK AND DEER GRAZING SITUATION					INITIAL ACTION		PROBABLE FORAGE ALLOCATION				
								AUMs Available From			Full Implementation of Proposed Action	
Allotment (Total Public Land Acres)	Available Forage AUMs	Present Season of Use	Present Grazing Preference AUMs	Past Active Authorized Use (AUMs)	Estimated Current Deer Use (AUMs)[a]	Initial Allocation (AUMs)	Initial Season of Use[b]	Water Development	Management	Vegetative Treatment	Total AUMs Allocated	Season of Use[c]
IMPLEMENT IMPROVED MANAGEMENT												
Spring/summer/early winter (RR) (continued)												
Meachum Canyon (1,951)												
Sheep	393	6/16-6/30 10/1-11/30	286	264	.....	393	6/16-6/30 10/1-11/30	.....	.....	.....	.....	RR - 12/31
Total Livestock	393	....	286	264	.....	393	....	23	38	91	545	....
Deer	401	Seasonal	.....	.....	87	87	....	.....	.....	162	563	....
	62	Critical winter	.....	.....	30	30	....	.....	.....	26	88	....
New Canyon (30,665)												
Cattle	4,568	5/16-9/30	4,752	4,663	.....	4,568	RR - 9/30	.....	.....	.....	.....	RR - 9/30
Sheep	267	5/10-6/19 10/23-11/18	267	267	.....	267	RR - 11/18	.....	.....	.....	.....	RR - 11/18
Total Livestock	4,835	....	5,019	4,930	.....	4,835	....	.....	.....	2,918	7,753	....
Deer	4,719	Seasonal	.....	.....	1,556	1,556	....	.....	.....	3,242	7,961	....
Other Uses[d]	140	....	.....	.....	.....	140	....	.....	.....	.....	140	....
Sage Creek (10,153)												
Cattle	954	5/10-9/30	959	947	.....	954	RR - 9/30	.....	.....	.....	.....	RR - 9/30
Sheep	89	5/10-6/30 10/30-11/8	89	89	.....	89	RR - 11/8	.....	.....	.....	.....	RR - 11/8
Total Livestock	1,043	....	1,048	1,036	.....	1,043	....	187	.....	896	2,126	....
Deer	2,787	Seasonal	.....	.....	388	388	....	.....	.....	925	3,712	....
Antelope	100	....	.....	.....	.....	.....	....	.....	.....	.....	100	....
Other Uses[d]	5	....	.....	.....	.....	5	....	.....	.....	.....	5	....
Twin Peaks (2,292)												
Sheep	316	5/22-6/30 9/20-10/20	273	271	.....	316	5/22-6/30 9/20-10/20	.....	.....	.....	.....	RR - 12/31
Total Livestock	316	....	273	271	.....	316	....	.....	.....	73	389	....
Deer	686	Seasonal	.....	.....	87	87	....	.....	.....	.....	686	....
Other Uses[d]	29	....	.....	.....	.....	29	....	.....	.....	.....	29	....
Woodruff Pastures (21,875)												
Cattle	3,911	5/16-9/15	3,911	3,892	.....	3,911	5/16-9/15	.....	.....	.....	.....	RR - 10/31
Sheep	914	5/16-5/31 11/1-1/13	914	912	.....	914	5/16-5/31 11/1-1/13	.....	.....	.....	.....	RR - 11/30
Total Livestock	4,825	....	4,825	4,804	.....	4,825	....	504	.....	1,682	7,011	....
Deer	929	Seasonal	.....	.....	1,007	929	....	.....	.....	921	1,850	....
	1,715	Critical winter	.....	.....	1,222	1,222	....	.....	.....	350	2,065	....
Spring/summer/fall (RR)												
East Woodruff (2,167)												
Cattle	179	5/1-6/15 12/1-1/7	162	175	.....	179	5/1-6/15 12/1-1/7	.....	.....	.....	.....	RR - 10/31
Total Livestock	179	....	162	175	.....	179	....	.....	.....	107	286	....
Deer	333	Seasonal	.....	.....	125	125	....	.....	.....	169	502	....
Antelope	20	....	.....	.....	.....	.....	....	.....	.....	.....	20	....

(continued)

APPENDIX 4 (concluded)

	LIVESTOCK AND DEER GRAZING SITUATION					INITIAL ACTION		PROBABLE FORAGE ALLOCATION				
								AUMs Available From			Full Implementation of Proposed Action	
Allotment (Total Public Land Acres)	Available Forage AUMs	Present Season of Use	Present Grazing Preference AUMs	Past Active Authorized Use (AUMs)	Estimated Current Deer Use (AUMs)[a]	Initial Allocation (AUMs)	Initial Season of Use[b]	Water Development	Management	Vegetative Treatment	Total AUMs Allocated	Season of Use[c]
Spring/summer/fall (RR) (concluded)												
Rabbit Creek (3,257)												
Cattle	486	5/10-10/10	486	484	.....	486	RR - 10/10	.....	.....	.....	.....	RR - 10/10
Total Livestock	486	....	486	484	.....	486	....	.....	.....	248	734	....
Deer	1,132	Seasonal	.....	.....	156	156	....	.....	.....	176	1,308	....
Antelope	3	....	.....	.....	.....	.....	....	.....	.....	.....	3	....
TOTAL (140,298)												
LIVESTOCK	22,350	....	24,124	22,898	......	22,350	....	1,182	38	11,913	35,241	....
DEER	27,482	....	.....	.....	8,513	8,435	....	.....	.....	8,819	35,798	....
ANTELOPE	372	....	.....	.....	.....	.....	....	.....	.....	.....	372	....
OTHER USES	422	....	.....	.....	.....	422	....	.....	.....	.....	664	....

[a] Estimated deer demand interpreted from Utah DWR estimates of existing needs.

[b] RR = Turn-on date for livestock grazing would be determined by range readiness estimated to be May 15 (Appendix 8) but would not be later than June 1. Turn-on for other allotments would be based on the date indicated. The end of the grazing season would be indicated by latest date shown.

[c] RR = Turn-on date for livestock grazing would be based on range readiness (Appendix 8) estimated to be no earlier than May 10 each year. The end of grazing season would be indicated by date shown.

[d] Other Uses means forage foregone to riparian fencing, recreation site development, and land disposal. See Appendix 3 Evolution of the Proposed Action.

NOTE: Proposed forage allocation for deer would be available from livestock vegetation treatment projects. The figure represents additional AUMs available to deer and would include summer and winter range forage needs. Total proposed deer forage allocation would be obtained by the addition of the initial level of use and any additional forage from vegetation treatment. There would be no quantifiable increase in deer AUMs from proposed range management, although quality would be expected to improve.

Past active authorized use should normally be within present grazing preference; where it is higher, the difference is attributable to temporary nonrenewable use (see Glossary). Past active authorized use is a 5-year average (1974 to 1978).

Available forage AUMs are best available estimate. Initial level of use is the proposed stocking level which is based on survey data and other resource information (Appendix 6).

Additional AUMs available from management and land treatment would be proposed for allocation to livestock. These AUMs represent forage that could be utilized by sheep and cattle. For allotments where no additional AUMs are shown, it is not possible to quantify any added increase in forage supply, although it would be expected that forage quality would be improved from the proposed management.

APPENDIX 5

Kind of Management

A. Season of Use

The livestock grazing season of use is an integral part of the existing and proposed livestock management on public lands in the Randolph Planning Unit. Season of use is the basic ingredient used in the formulation of each grazing and resting treatment for the proposed action.

The proposed season of use was determined by BLM during the planning process. The existing grazing season in each allotment was evaluated based on criteria such as plant growth requirements, operator needs, climatic factors, vegetation type (existing and potential production), and limiting physical factors such as terrain and available water. In addition, land use conflicts were identified for the existing grazing situation and multiple use objectives were considered.

The season of use for each allotment was based on its management objectives relating to livestock forage and other resource management goals. The on and off dates (when livestock grazing begins and ends) used in the proposed action may be based on several factors. They may be preset on the basis of firm calendar dates, usually determined by using a prescribed amount of forage (stocking level). This usually involves seasons where off dates are concerned, i.e., livestock come off the allotment when the authorized amount of forage has been utilized (based on number of animals and time). This is true for the existing situation and the initial action. Preset dates may also apply to turn-on (grazing begins) times. This is the current method used under existing livestock management, but would also apply to select allotments in the initial action. Turn-on dates for the initial and long-term management component are most frequently established by determination of range readiness.

The range readiness method for determining turn-on dates uses specific criteria relating to plant growth and influencing factors such as climatic conditions and type of grazing management. BLM range specialists considered the phenological growth of desirable forage plants and rate of forage production (Randolph MFP Step 2, 1978) in the selection of criteria for determining range readiness. Indicator plant species (bluebunch wheatgrass and crested wheatgrass) were identified for native ranges and introduced grass seedings in the Randolph Planning Unit. These species also represent growth characteristics for other desirable forage plants. From a review of available range management literature and documented field data specific to Utah and the Randolph Planning Unit, BLM range specialists have developed the criteria shown in table 1 for determining range readiness.

In addition, socioeconomic factors relating to existing livestock operations were considered by BLM managers as important criteria. In Rich County, hay production on private pasture and meadow lands is used to feed animals during the winter months. It is critical to their operation that ranchers be able to utilize spring hay production as winter feed (Randolph URA and PACE). As a result, BLM managers have proposed turn-on dates be determined by range readiness, but would be allowed to occur at least by June 1 (Randolph MFP Step 2 and Appendix 3 Evolution of Proposed Action). Also, because of additional long-term range management objectives relating to improved livestock forage production and wildlife habitat, utilization limits were placed on the proposed level of livestock grazing. Specifically, long-term utilization of livestock forage would not exceed 50 percent for desirable grasses and 60 percent for desirable browse species (table 1-3). To accomplish this and meet other plant growth requirements (shown on Appendix 3), it is proposed that turn-on, as determined by range readiness for the long-term management, occur no earlier than May 10 (estimated). The purpose of the 50 to 60 percent utilization limit would be to improve plant vigor and seed production (BLM Range Management Manual 4412). Better protection of the watershed (from soil erosion) and habitat for small animals and birds would be provided by the residual forage not consumed by livestock.

TABLE 1

Criteria for Determining Range Readiness - Randolph Planning Unit

	Range Readiness Under Continuous Allotment-wide Grazing	Range Readiness Under Grazing Treatments that Provide for Rest or Deferment During Growing Season	Summary of Rationale and Documentation
Native Vegetation Ranges			
Indicator species: bluebunch wheatgrass	When 7-inch height is reached. Estimated to be May 15.	When 4-inch height is reached. Estimated to be between May 1 to 10.	Grazing treatments that provide for rest or deferment during growing season improve plant vigor. Cook (1966) indicates that vigor relates to rate of growth and food production and storage. It is inferred that plants in improved vigor mature faster than plants in low vigor. SCS Technical Note 32e (1963) relates to growth and food production characteristics for bluebunch wheatgrass in Utah and establishes height criteria. Local climatic data allowed estimation for dates specific to the Randolph area.

(continued)

TABLE 1 (concluded)

	Range Readiness Under Continuous Allotment-wide Grazing	Range Readiness Under Grazing Treatments that Provide for Rest or Deferment During Growing Season	Summary of Rationale and Documentation
Introduced Vegetation (Seedings)			
Indicator species: crested wheatgrass	When 4-inch height is reached. Estimated to be May 10.	When 3-inch height is reached. Estimated to be May 1.	Grazing treatments improve vigor, rate of plant growth, and food storage. Rationale similar to above. Oregon BLM State Office Manual supplement 9/30/70 Release No. 4-102 provides height criteria. Data from Benmore Experimental Area in Utah (USDA Technical Note 1388, Aug. 1978) provides correlation with growth and development in Utah. Interpretation of local climatic factors allows estimation of dates specific to the Randolph area.

Table 2 summarizes the proposed season of use for each allotment. This table shows the method for determining turn-on and variations within the broad seasons of use (spring, summer, fall, winter) required to reach objectives. Each of the proposed seasons was determined by considering the factors identified above.

The purpose for proposing to graze in these periods and rest during the remaining year is described in the next section of this Appendix relating to grazing and resting treatments.

B. Grazing Treatments

In both the proposed initial action and long-term management components, livestock grazing on allotments would be controlled by grazing treatments which would incorporate specific seasons and levels of grazing with definite grazing and resting periods. Grazing proposed for the Randolph Planning Unit varies in complexity, usually because of the arrangement of each grazing and resting treatment within the system.

This appendix discusses the types of treatments proposed, together with seasons of use and application of definite grazing and resting periods. Appendix 6 contains a discussion of the levels of use proposed.

The purpose of the grazing treatments proposed in this volume would be to regulate livestock use in order to meet management objectives. Grazing treatments provide BLM with a means to manipulate vegetation to achieve a desired response (e.g., certain type of plant composition) on select areas. The proposed treatments are designed to promote a desirable level of livestock use while meeting the needs of the other resources as identified in the Randolph MFP. The ultimate goal of all the proposed treatments would be to provide a sustained, long-term production of forage for livestock and wildlife.

The following general criteria were used by BLM managers and resource specialists (range, watershed, wildlife) to select the proposed grazing treatments:

1. Grazing unit size and shape, land ownership patterns.
2. Physical characteristics (slope, elevation, climate).

TABLE 2

Grazing Season by Allotment

Allotment	Initial Action	Long-Term Management	Initial Same as Long-Term
DISPOSAL			
Middle Ridge	Late spring, summer, fall, early winter	Proposed for elimination	....
Session	RR summer, early fall	Proposed for elimination	....
CONTINUE INITIAL ACTION MANAGEMENT: ALLOTMENT-WIDE GRAZING			
Eastman	RR summer, fall	RR summer, fall	Same
Deseret	RR summer, early fall	RR summer, early fall	Same
South Woodruff	RR summer, early fall	RR summer, early fall	Same
IMPLEMENT IMPROVED MANAGEMENT			
Bear Lake	RR summer, early fall	RR summer, early fall	Same
Big Creek	RR summer, fall, early winter	RR summer, fall, early winter	Same
Dry Basin	RR summer, early fall	RR summer, early fall	Same
Duck Creek	RR summer, fall, early winter	RR summer, fall, early winter	Same
East Woodruff	Spring, winter	RR summer, late fall	No
Kearl	Spring, early fall	RR summer, early fall	Same
Laketown	RR summer, early fall	RR summer, early fall	Same
Meachum Canyon	Late spring, late fall, early winter	RR summer, fall, early winter	No
New Canyon	RR summer, fall, early winter	RR summer, fall, early winter	Same
Rabbit Creek	RR summer, late fall	RR summer, late fall	Same
Sage Creek	RR summer, fall, early winter	RR summer, fall, early winter	Same
Stuart	Midsummer, late summer	RR summer, early fall	No
Twin Peaks	Midspring, late spring, fall	RR summer, fall, early winter	No
Woodruff Pastures	Midspring, summer, early fall, winter	RR summer, fall, early winter	No

Legend: RR = Range Readiness

RR for Initial Action would be midspring (estimated earliest turn-on 5/15 but no later than 6/1).

RR for Long-Term Management would be early spring (no earlier than 5/10), except for Eastman, Deseret, and South Woodruff Allotments, which would be initial action RR.

Spring (5/1-6/30)	Summer (7/1-7/15)	Fall (9/1-10/31)	Winter (11/1 and beyond)
Early spring 5/1-5/14	Early summer 7/1-7/15	Early fall 9/1-9/30	Early winter 11/1-12/31
Midspring 5/15-5/31	Midsummer 7/16-7/31	Late fall 10/1-10/31	Late winter 1/1 and beyond
Late Spring 6/1-6/30	Late summer 8/1-8/31		

3. Vegetation factors (present condition, production, present use, composition, physiological requirements, and estimated potential for improvement).

4. Resource constraints identified in land use planning.

5. Resource management objectives (wildlife, watershed, soil, and recreation).

6. Desired vegetation condition (composition, production, and degree of use).

7. Sequence and timing of grazing to meet management objectives.

8. Livestock handling requirements of the operator and grazing system preference, animal grazing behavior.

9. Existing range improvements (location and condition).

10. Needed improvements and development practices.

11. Resource specialist professional judgment of treatment considered best adapted to achieve resource objectives.

There are three basic types of grazing treatments proposed in both the initial action and long-term management components:

1. Allotment-wide Continuous Grazing

This would allow livestock to graze over the entire allotment for the same period of time each year (fig. 1). This is the program most commonly used for the existing livestock grazing operations; however, in most instances, the entire growing season is grazed. There are no associated range developments proposed to accompany this grazing treatment which is proposed for use in areas where periodic rest or deferment (which would require multiple pastures) are not feasible. Maintenance of forage productivity would be the management objective for allotments adopting this program.

FIGURE 1

Allotment-wide Continuous Grazing
(Early spring, summer, fall treatment)

	Year 1				Year 2				Year 3				Year 4			
Entire	Sp	Sm	F	W	Sp	Sm	F	W	Sp	Sm	F	W	Sp	Sm	F	W
Allotment	R	Graze		R	R	Graze		R	R	Graze		R	R	Graze		R

Sp = Spring   Sm = Summer   F = Fall   W = Winter   R = Rest

2. Rotational Rest

This would require several pastures, all nearly equal in terms of forage production. Each pasture would be systematically grazed and rested over an entire grazing cycle (fig. 2). The following criteria were used for selecting rotational rest grazing:

a. The requirement for long periods of rest to restore livestock forage condition, plant vigor, and vegetation cover.

b. The need to tailor grazing treatments to the physiological requirements of specific key management species.

c. The need to manipulate vegetation communities to produce desirable species compositions within a relatively short period of time.

This treatment is designed to increase livestock forage production as well as improve the condition of wildlife habitat (primarily the vigor of key browse species). It is proposed for use in areas where vegetation resources have good potential for improvement and where physical factors are favorable for implementation. This treatment would allow livestock grazing during the growing season, while also providing rotating periods of rest on different portions of the allotment (to allow plants the opportunity to grow and reproduce).

The existing livestock grazing operation on the Woodruff Pastures Allotment is a variation of this program but, due to additional rest requirements and management objectives imposed, only part of this allotment (Dry Basin Pasture) is proposed for rotational rest in the long term. A browse seeding treatment to improve critical winter habitat for deer is proposed for Dry Basin Pasture to provide rest for key browse species during two consecutive grazing seasons. To promote seedling establishment and continued growth thereafter (BLM Manual 4412), rotational rest grazing could be used to provide Dry Basin Pasture with rest during the growing season for 2 years out of each 5-year period.

FIGURE 2

Rotational Rest Grazing

	Year 1	Year 2	Year 3	Year 4	Year 5
Dry Basin	Sp Sm F W	Sp Sm F W	Sp Sm F W	Sp Sm F W	Sp Sm F W
Pasture	Graze		Graze		Graze

Sp = Spring Sm = Summer F = Fall W = Winter R = Rest

3. Rotation of Grazing Use and Rest (Deferment) During the Growing Season

This would defer and rotate livestock grazing each year during at least past of the growing season (5/1-6/30). Under this treatment, a pasture must be rested before being grazed more than 2 years in a row during the early spring. In addition, every pasture must be completely rested during the growing period until seed ripe (when plants reach maturity), every 1 out of 5 years. Although similar in many respects to proposed rotational rest, this treatment does not provide a full year's rest every year to some portion of the allotment.

Rotational growing season deferment was selected by BLM range specialists because it is highly adaptable to different sized allotments and varied physiographic characteristics, and does not require long rest periods to satisfy management objectives. An additional factor is that it requires a minimum of change to the existing general livestock operations. Existing pasture layouts could be utilized and supporting range development construction (fences, water) would be minimized.

The range management objectives achieved by this program would include improved plant vigor and seed production, plus increased production of livestock forage.

Figure 3 shows how three-pasture rotational/growing season deferment would operate.

FIGURE 3

Rotational/Growing Season Deferment Grazing
(Spring, Summer, Fall Treatment)

	Year 1				Year 2				Year 3				Year 4				Year 5				Year 6			
Pasture	Sp	Sm	F	W	Sp	Sm	F	W	Sp	Sm	F	W	Sp	Sm	F	W	Sp	Sm	F	W	Sp	Sm	F	W
1	G				G						G				G			G				G		
2		G				G			G				G						G				G	
3			G				G			G				G			G				G			

Sp = Spring Sm = Summer F = Fall W = Winter R = Rest G = Graze

Table 3 shows proposed grazing treatments with initial and long-term management actions for each allotment.

TABLE 3

Grazing Treatments by Allotment

Allotment	Acres	AUMs
ALLOTMENT-WIDE CONTINUOUS		
Initial Action		
Bear Lake	1,198	140
Big Creek	20,346	3,116
Deseret	15,557	3,062
Dry Basin	2,781	510
Duck Creek	13,410	1,745
Eastman	3,405	612
Kearl	1,183	176
Laketown	3,241	296

[a] AUMs for long-term management include initial stocking level AUMs and additional AUMs due to increased forage productivity from grazing and vegetation treatments.

[b] These allotments are proposed for livestock elimination. They will be managed under this program until elimination would be effected.

(continued)

TABLE 3 (continued)

Allotment	Acres	AUMs
Middle Ridge	1,286	202
New Canyon	30,665	4,835
Rabbit Creek	3,257	486
Sage Creek	10,153	1,043
Session	238	40
South Woodruff	4,251	314
Stuart	1,042	60
Total	112,013	16,637
Long-Term Management	Acres	AUMs[a]
Deseret	15,557	3,062
Eastman	3,405	612
Middle Ridge[b]	1,286	202
Session[b]	238	40
South Woodruff	4,251	314
Total	24,737	4,230
ROTATIONAL REST		
Initial Action	Acres	AUMs
Woodruff Pastures[c]	21,875	4,825
Total	21,875	4,825
Long-Term Management	Acres	AUMs[b]
Woodruff Pastures (Dry Basin Pasture)	2,625	779
Total	2,625	779

[a] AUMs for long-term management include initial stocking level AUMs and additional AUMs due to increased forage productivity from grazing and vegetation treatments.

[b] These allotments are proposed for livestock elimination. They will be managed under this treatment until elimination would be effected.

[c] The initial action would propose to continue these existing grazing treatments which are actually variations of the ones described in the previous discussion.

(continued)

TABLE 3 (concluded)

Allotment	Acres	AUMs
ROTATIONAL GROWING SEASON DEFERMENT		
Initial Action[c]	Acres	AUMs
East Woodruff	2,167	179
Meachum Canyon	1,951	393
Twin Peaks	2,292	316
Total	6,410	888
Long-Term Management	Acres	AUMs[a]
Bear Lake	1,198	150
Big Creek	20,346	6,494
Dry Basin	2,781	614
Duck Creek	13,410	4,394
East Woodruff	2,167	286
Kearl	1,183	208
Laketown	3,241	375
Meachum Canyon	1,951	545
New Canyon	30,665	7,753
Rabbit Creek	3,257	734
Sage Creek	10,153	2,126
Stuart	1,042	174
Twin Peaks	2,292	389
Woodruff Pastures (except Dry Basin Pasture)	19,250	6,232
Total	112,936	30,474
GRAND TOTAL		
Initial Action	140,298	22,350
Long-Term Management	140,298	35,483

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[a] AUMs for long-term management include initial stocking level AUMs and additional AUMs due to increased forage productivity from grazing and vegetation treatments.

[b] These allotments are proposed for livestock elimination. They will be managed under this treatment until elimination would be effected.

[c] The initial action would propose to continue these existing grazing treatment which are actually variations of the ones described in the previous discussion.

C. Rationale for Determination of Grazing and Resting Treatments

The previously described seasons of use form the basis for the grazing and resting treatments proposed for each allotment. The treatments are applied to the allotments through grazing and are applied, either consistently throughout the allotment, or are rotated around in various schemes described in part B (Grazing Treatments).

Grazing and resting treatments proposed for the Randolph Planning Unit are carefully developed prescriptions which define the periods when an allotment would be grazed and rested, determined by plant needs and management objectives. The overall purpose of these treatments would be to manage livestock grazing in a way that would allow key forage species (table 4) for both livestock and wildlife (see part D. Key Species), an opportunity to complete normal growth and reproductive processes.

Plant phenology (when plants grow, manufacture food, mature and reproduce) is a principal ingredient in the design of these treatments. Range specialists have collected this information for the Randolph Planning Unit by means of field observation and available literature, and have estimated average dates for the beginning of plant growth, flowering, and seed production for most key forage plants in the Randolph ES area (part D. Key Species).

In addition, BLM range specialists have studied and considered specific characteristics relating to the health and vigor of key forage plants in order to evaluate and determine needed improvement. These characteristics include observed vigor, evidence of reproduction, success of seedling establishment, and degree of livestock utilization. These studies involved field observations on each allotment during the 1976-78 field seasons. A more complete description of these factors and the results of these studies are contained in Chapter 2, Vegetation.

Other resource values such as wildlife habitat were evaluated and used to help design specific grazing and resting treatments. The condition and quality of wildlife habitat were examined and limiting factors such as lack of thermal cover, reproduction of key browse species, nesting habitat, and winter forage supply were identified (Chapter 2,

TABLE 4

Key Species for Livestock and Deer by Allotment

	Critical Period						
Allotment	4/15-5/15 Agcr (grass)	5/1-6/1 Agsp (grass)	4/3-9/15 Artr (shrub)	4/21-7/15 Putr (shrub)	NA Cemo (shrub)	NA Amal (shrub)	NA Arno (shrub)
DISPOSAL							
Middle Ridge							
Initial		X		0			
Long term (disposal)							
Session							
Initial		X					
Long term (disposal)							
CONTINUE INITIAL ACTION MANAGEMENT: ALLOTMENT-WIDE GRAZING							
Eastman							
Initial		X		0		0	
Long term		X		0		0	
Deseret							
Initial		X	0				
Long term		X	0				
South Woodruff							
Initial		X		0			
Long term		X		0			
IMPLEMENT IMPROVED MANAGEMENT							
Bear Lake							
Initial		X		0	0	0	
Long Term		X		0	0	0	
Big Creek							
Initial	X	X		0		0	
Long Term	X	X		0		0	
Dry Basin							
Initial		X				0	
Long Term		X				0	
Duck Creek							
Initial		X		0		0	
Long term		X		0		0	
East Woodruff							
Initial	X	X	0				
Long term	X	X	0				

(continued)

NOTE: Critical periods would occur when plants are actively growing (begin growth in spring through seed ripe).

Agcr = Agropyron cristatum, crested wheatgrass
Artr = Artemisia tridentata, big sagebrush
Amal = Amalanchier alnifolia, snowberry
Agsp = Agropyron spicatum, bluebunch wheatgrass
Cemo = Cercocarpus montanus, mountain mahogany
Putr = Purshia tridentata, antelope bitterbrush
Arno = Artemesia nova, black sagebrush

Key species are those plant species that would be monitored to evaluate if proposed range management objectives are achieved. These species would generally indicate the response to and effectiveness of the proposed action on the vegetation community.

X = Primary species important to livestock forage

0 = Primary species important to wildlife (deer)

TABLE 4 (concluded)

	Critical Period						
	4/15-5/15	5/1-6/1	4/3-9/15	4/21-7/15	NA	NA	NA
Allotment	Agcr (grass)	Agsp (grass)	Artr (shrub)	Putr (shrub)	Cemo (shrub)	Amal (shrub)	Arno (shrub)
Kearl							
Initial		X		0		0	
Long term		X		0		0	
Laketown							
Initial		X		0	0	0	
Long term		X		0	0	0	
Meachum Canyon							
Initial		X	0	0		0	
Long term		X	0	0		0	
New Canyon							
Initial	X	X		0		0	
Long term	X	X		0		0	
Rabbit Creek							
Initial		X		0		0	
Long term		X		0		0	
Sage Creek							
Initial		X		0		0	
Long term		X		0		0	
Stuart							
Initial		X					0
Long term		X					0
Twin Peaks							
Initial		X	0	0		0	
Long term		X	0	0		0	
Woodruff Pastures							
Initial	X	X	0			0	
Long term	X	X		0		0	

Source: Average Phenological Periods from Field Observations in the Randolph Planning Unit. BLM 1976-77.

NOTE: Critical periods would occur when plants are actively growing (begin growth in spring through seed ripe).

Agcr = Agropyron cristatum, crested wheatgrass
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X = Primary species important to livestock forage

0 = Primary species important to wildlife (deer)

Wildlife) and also used to determine the amount of grazing and rest required for each allotment.

The proposed grazing and resting treatments are designed to fulfill specific management objectives under the proposed action (table 1-2, Objectives of the Proposed Action). For example, the objective to maintain forage productivity would entail grazing and resting treatments that would improve vigor and allow for the manufacture and storage of food. This would be accomplished by applying treatments that delay grazing for a portion of the spring growing period. In addition, management objectives for improving condition and forage productivity would be accomplished by treatments that defer grazing until after seeds ripen.

Treatments proposed for the Randolph Planning Unit are summarized in table 5.

D. Key Species

In developing and measuring the objectives for each allotment, key plant species are used to indicate range condition, trends in condition, and intensity of grazing. These key species are responsive to changes in grazing and are well adapted to the area.

These species would be an integral part of the monitoring and study program included in the proposed action. Key species are also important in the design of grazing and resting treatments and the actual operation of proposed grazing systems. Phenology data for key species are used to determine range readiness. Utilization rates for key species in a specific allotment indicate when the proper amount of forage has been utilized and determine the ending date for livestock grazing. These species would be used to monitor the utilization rates during the long term in order to determine when the upper limit of livestock use has been achieved. The maximum allowable use by livetock would be 50 percent on grass and 60 percent on shrubs.

The following criteria adapted from Stoddart et al., (1975) were used by BLM to help select key species:

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The proposed grazing and resting treatments are designed to fulfill specific management objectives under the proposed action (table 1-2, Objectives of the Proposed Action). For example, the objective to maintain forage productivity would entail grazing and resting treatments that would improve vigor and allow for the manufacture and storage of food. This would be accomplished by applying treatments that delay grazing for a portion of the spring growing period. In addition, management objectives for improving condition and forage productivity would be accomplished by treatments that defer grazing until after seeds ripen.

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The following criteria adapted from Stoddart et al., (1975) were used by BLM to help select key species:

TABLE 5

Grazing and Resting Treatments

Livestock Grazing Period[a]	Resting Period[a]	Purpose
1. No livestock grazing	Yearlong	Rest to improve vigor of all species (grass, forb, browse). Rest to improve cover and litter accumulation. Rest to allow for natural growth and reproductive processes, food storage, and seed production.
2. Spring, summer, early, fall (RR)[b]	Late fall, winter	Range readiness turn-on would allow grazing to begin when rate of forage production is high and food reserves are building up from newly manufactured food. Food storage and seed production would increase, vigor of grass would improve. Defer grazing in spring to allow for food manufacture, storage, and improved vigor. Defer to improve cover and litter accumulation. Defer grazing until after seed ripe to allow for seed production, maximum food storage, and to promote seed establishment by trampling. Graze to provide high quality forage for livestock. Rest to allow for fall regrowth and improve vigor of browse.
3. Spring, summer, fall, early winter (RR)[b]	Late winter	Range readiness turn-on would allow grazing to begin when rate of forage production is high and food reserves are building up from newly manufactured food. Food storage and seed production would increase, vigor of grass would improve. Defer grazing in spring to allow for food manufacture, storage, and improved vigor. Defer to improve cover and litter accumulation. Defer grazing until after seed ripe to allow for seed production, maximum food storage, and to promote seed establishment by trampling. Graze in spring to provide high quality forage for livestock. Graze in fall for livestock forage. Rest in winter to help restore vigor of browse species.
4. Spring, summer, fall (RR)[b]	Winter	Range readiness turn-on would allow grazing to begin when rate of forage production is high and food reserves are building up from newly manufactured food. Food storage and seed production would increase, vigor of grass would improve. Defer grazing in spring to allow for food manufacture, storage, and improved vigor. Defer to improve cover and litter accumulation. Defer grazing until after seed ripe to allow for seed production, maximum food storage and to promote seed establishment by trampling. Graze in spring to provide high quality forage for livestock. Rest in winter to improve vigor of browse. Graze in fall for livestock forage.
5. Spring, fall	Summer, winter	Graze in spring and fall to provide high quality forage for livestock. Rest in winter to improve vigor of browse. Rest in summer to allow for flower formation, seed ripening, and maximum food storage, and to improve vigor of grass.
6. Late spring, late fall, early winter	Late winter, early spring, summer	Rest in early spring to allow for food production to continue and storage to begin. Graze in late spring to provide high quality forage for livestock. Rest in summer to allow for seed ripening and improved vigor of grass. Rest in early fall to improve browse vigor and allow for regrowth. Graze in fall for livestock forage and seed trampling. Rest during winter for improved browse vigor.

[a] Treatments for both initial action and long-term management.
[b] These treatments would apply to long-term grazing systems that rotate deferment and rest periods.

(continued)

TABLE 5 (concluded)

Livestock Grazing Period[a]	Resting Period[a]	Purpose
7. Late spring, summer, fall, early winter	Late winter, early spring	Rest in late winter for improved vigor of browse. Rest in early spring to allow for forage production and food storage; would improve grass vigor. Graze in late spring and summer to provide high quality livestock forage. Graze regrowth in fall and winter for livestock forage and some seed trampling.
8. Spring, summer, late fall (RR)[b]	Winter	Range readiness turn-on would allow grazing to begin when rate of forage production is high and food reserves are building up from newly manufactured food. Food storage and seed production would increase, vigor of grass would improve.
		Defer grazing in spring to allow for food manufacture, storage and improved vigor. Defer to improve cover and litter accumulation. Defer grazing until after seed ripe to allow for seed production, maximum food storage, and to promote seed establishment by trampling. Graze in spring to provide high quality forage for livestock. Rest in winter to improve vigor of browse. Graze in fall for livestock forage.
9. Midsummer, late summer	Fall, winter, spring	Graze in summer to provide high quality livestock forage and trample seed. Rest to improve vigor of all species. Rest in fall and spring to allow for manufacture and storage. Rest to improve cover and litter accumulation.
10. Midspring, late spring, fall	Late winter, early spring	Graze in spring and fall for high quality livestock forage. Rest in winter and early spring for improved vigor of grass and browse. Rest in summer to allow for food storage and seed ripening.
11. Midspring, summer, early fall, winter	Late winter, early spring	Graze to provide high quality livestock forage. Rest in winter for improved browse vigor. Rest in early spring for grass vigor.

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[a] Treatments for both initial action and long-term management.

[b] These treatments would apply to long-term grazing systems that rotate deferment and rest periods.

1. Its relative palatability and preference (key species should make up approximately the same part of the diet throughout the grazing season).

2. Its ecological status (even though certain plants are rare in abundance, they may be the climax or dominant plant that is best adapted).

3. Its importance in terms of providing the bulk of the forage supply.

4. Its relation to other plants on the range (when key species are properly used, so should the entire range).

Other factors relating to management objectives, kinds of livestock and wildlife, critical habitat needs, and relation to other aspects of the proposed action (example: spraying and seeding) were also considered in the selection of key species.

Table 4 identifies key species by allotment for livestock and deer.

APPENDIX 6

Methodology for Determining Level of Use

The determination of the initial level of livestock use was a three-phase process:

1. Estimation of Available Livestock and Deer Forage

An ocular reconnaissance range survey of the Randolph unit was initiated in the fall of 1976 and completed in the summer of 1977. After a thorough analysis of the data, it was decided that the forage production data were not usable because of drought conditions and the lack of a well-documented forage acre requirement (FAR) pasture. A resurvey was completed in 1978, using this same method. The vegetation type lines and acreages from the 1977 survey were used, but were changed in areas where the 1978 survey crew did not agree with the previous years' work.

Survey crews were from the BLM Salt Lake District. In addition to field resource inventory, survey personnel obtained pertinent on-the-ground information on the location of waterholes and potentially suitable areas for grazing.

BLM Suitability Guidelines for Livestock Grazing (Instruction Memo 78-134) were followed except where on-the-ground situations required modification. Appendix 10 explains how suitability determinations were made.

To monitor any differences in vegetation density and composition that might occur during the survey period, two-line-intercept transects were established and read prior to and after the survey was completed. There was no appreciable difference in these factors and no adjustment to the basic survey data was required.

To compute a forage acre requirement, actual production was clipped on each major vegetation type. The production for each plant species was multiplied by the proper use factor (PUF) to arrive at available forage for each kind of animal.

Vegetation composition and density information collected in the field along with suitability information were recorded for direct processing by computer. Proper use factors for each plant species and kind of animal in the Randolph Planning Unit were determined by BLM personnel and, together with the FARs for each vegetative type, were used in the determination of available forage. The following illustrates how this calculation was determined:

The PUF is multiplied by the percent composition for each species. These figures are totaled to get the average PUF. The average PUF is multiplied by the percent density to get the Forage Acre Factor (FAF). The FAF is then multiplied by the acres per AUM resulting in the Forage Acre Requirement (FAR).

In the following example, the percent composition (25 percent) for Agsp (bluebunch wheatgrass), is multiplied by the value from the Proper Use Table, in this case 40 percent, to get the .1 FAF. These factors are then computed to get the average FAF which is multiplied by the forage density, in this case 32 percent, to get the net FAF (table 1). The net FAR is then divided by the net FAF to get acres per AUM. The acres per AUM figure is multiplied by the number of acres in each suitability class to get the total AUMs for each writeup.

TABLE 1

Average PUF		Density		Net FAF
0.14	x	0.32	=	0.0448
0.18	x	0.32	=	0.0576
0.11	x	0.32	=	0.0352

FAR	÷	Net FAF	=	Acres per AUM
0.49	÷	0.0448	=	10.9
0.30	÷	0.0576	=	5.2
0.27	÷	0.0352	=	7.7

The process illustrated above was performed by computer and maximizes forage use for each kind of grazing animal for each season of use.

A second step also performed by computer is an interactive process which looks at individual writeups and analyzes the available AUMs, based on the dietary preferences of the using animals. The examples cited below illustrate the process used in making the various determinations based on this dietary overlap:

For all plant species except crested wheatgrass, the total percent that can be grazed without detriment is 50 percent. This is known as Total Allowable Proper Use Factor (TAPUF). Using the TAPUF of 50 percent for the grass *Mulhenbergia*, the following computations would determine amounts to be used by animals:

Mulhenbergia TAPUF = 50 percent
Cattle Proper Use Factor = -30 percent
Remainder for Other Animals = 20 percent
Sheep Proper Use Factor = -10 percent
Remainder for Other Animals = 10 percent
Deer Proper Use Factor = -5 percent
Remainder Unused = 5 percent

In this second example using Indian ricegrass, demand exceeds forage availability:

Indian Ricegrass TAPUF = 50 percent
Cattle Proper Use Factor = -40 percent
Remainder for Other Animals = 10 percent
Sheep Proper Use Factor = -30 percent
    Insufficient Forage for Sheep = (20 percent)
Remainder for Other Animals = 0 percent
Deer Proper Use Factor = 5 percent
    No Forage Allocated to Deer = -5 percent
Total Insufficient Indian Ricegrass Forage = (25 percent)

Since the Proper Use Factor for sheep exceeds the amount available, only the amount available (10 percent) is allocated for sheep. Similarly, since no forage is available for deer, none is allocated.

After these computer calculations are completed, another program called Goal is prepared to compare the differences in acres suitable for grazing and quantify the forage that is available for allocation.

During initial runs of the forage calculation program, it was noted that a large percent of the total diet for sheep was from sagebrush, so the percent of big sagebrush in the sheep diet was limited to about 15 percent because of the lack of associated species. Use of big sagebrush by cattle was not limited because there was ample plant diversity for the first level of grazing. Where sheep are the second level, often the grass species may be completely committed and there are not enough associated plants to allow total use of the sagebrush. Because of the high deer PUF on sagebrush, no dietary limitations were made.

2. Determination of Other Resource Information

A series of studies and inventories were conducted in order to determine the existing conditions of resources which were considered in the development of the proposed action. These data were considered in the determination of initial use levels proposed and are discussed below.

The livestock forage condition rating was derived from the computer using information collected by survey crews. This rating was based on the percent of the vegetation composition made up of desirable, intermediate, and least desirable forage species. Table 1 shows how ratings were determined.

Plants with a PUF of 35 to 50 percent are desirable; those from 15 to 34 percent are intermediate, and those less than 15 percent are least desirable.

Also gathered at the study site were apparent trend data determined by (1) evaluating the vigor of desirable forage species, (2) by the amount of seedling establishment of desirable species, (3) by the amount and apparent movement of surface litter, (4) by the amount of plant and

TABLE 1

Livestock Forage Condition Rating

Range Condition	Composition	Soil Surface Factor[a]
Good	At least 20 percent desirable species, with desirable and intermediate species totaling at least 40 percent	Less than 40
Fair	At least 5 percent desirable species, with desirable and intermediate species totaling at least 15 percent	Less than 60
	OR	
	At least 60 percent intermediate species	Less than 60
Poor	All else	

[a] A rating indicating current erosion and erosion susceptibility.

rock pedestalling, and (5) by the presence and condition of gullies. Each of these factors was assigned a numerical score. Based on the cumulative score for all factors, the type was rated to be in upward, static, or downward trend. For more detail, see Appendix 11.

In addition, forage utilization data taken from studies made during 1978 and active authorized use for 1978 were used to determine the proposed initial level of livestock use. Preferred browse condition determined by field study was evaluated in 1977-78, as was the overall condition of wildlife habitat. These data were also considered in arriving at the proposed initial level of use. Data from an aquatic habitat inventory and watershed studies made in 1976-77 were also evaluated.

3. Judgment Evaluation of Resource Data

The following process of data analysis was used to interpret factual information described above and develop a judgment of appropriate initial use levels:

a. Reductions or increases in stocking were made using the range survey as a starting point.

b. Where range condition, trend, utilization, and authorized use support acceptance of the survey carrying capacity, adjustments were made accordingly.

c. Where the other data conflicted significantly with survey stocking estimates, smaller adjustments or no adjustments were made.

d. Wildlife and watershed information were also considered, and in some cases, modified carrying capacity estimates.

e. Conflicts with other resources resulted in further modification of the decision in some allotments. For example, where the following information existed:

(1) Range survey data estimated less cattle forage available and an excess supply of sheep forage.

(2) Forage utilization ranges from 59 to 74 percent.

(3) Forage condition for cattle is fair and poor, and forage condition for sheep and deer are fair to good.

(4) Apparent trend is down or static.

(5) Condition of wildlife habitat and preferred browse is poor.

A judgment evaluation was made to reduce existing cattle use in order to improve forage conditions, induce an upward trend, and reduce existing utilization levels. Increases in sheep use were not considered appropriate since this would increase overutilization and intensify competition between livestock and wildlife. Where this situation applied, proposed reductions in cattle use range between 7 to 25 percent and no sheep increases were proposed.

Where the following information existed:

(1) Range survey data estimated an increase in livestock use.

(2) Forage condition is primarily good or fair.

(3) Apparent trend is upward or static.

(4) Forage utilization ranges from 12 to 45 percent.

(5) Wildlife habitat and preferred browse condition are generally good.

Increases in existing livestock use are proposed. However, increasing use levels to the maximum amount estimated to be available by the range survey were not proposed when forage utilization would increase beyond the upper limit proposed in Chapter 1 (50 percent on grass and 60 percent on shrubs). For these situations, the initial stocking level was modified and constrained so as not to exceed allowable utilization levels.

A third example illustrates situations where the following information existed:

(1) Range survey data estimated an increase in sheep forage available and a reduction in cattle forage available.

(2) Forage condition is primarily fair or good.

(3) Apparent trend is static.

(4) Forage utilization is moderate (less than 50 percent).

(5) Watershed and wildlife habitat conditions are good (no problems evident).

A judgment evaluation was made that would propose to leave cattle use at existing levels because corresponding resource information does not totally support survey estimates. Meanwhile, further trend, actual use, and utilization studies would be conducted to a more conclusive picture of resource needs.

A more detailed discussion of the methodology for determining levels of initial livestock use is contained in Appendix 2 of the Randolph Management Framework Plan (MFP). The above noted procedure was used on each allotment. Results are shown in Appendix 4. The initial stocking level is considered to be the best available estimate.

The level of use for the long-term management would begin with the initial stocking level. In time, as forage production increases, additional livestock use would be authorized if range management objectives are being achieved. In order to make this future allocation for the proposed action, an estimate of the expected potential forage production was determined.

The basis for this determination was provided by considering ecological site information obtained from SCS Range Site Descriptions. These descriptions indicated the general productivity of each range site under climax ecological conditions. In addition, actual forage production clipping studies on good condition range helped BLM determine the realistic maximum level of forage production that could be expected for different vegetation types in the Randolph Planning Unit.

Plant composition restrictions imposed on future vegetation treatments were proposed to accommodate livestock and wildlife needs. These compositions were plugged into the range survey calculations similar to the way existing compositions were used in the computation of forage availability. This provided an indication of the expected level of forage production for livestock and wildlife from the proposed treatment projects. This figure is shown for each allotment in Appendix 4, Existing and Proposed Grazing. Composition restrictions are identified on table 1-3.

The additional amount of forage increase that could be expected due to improved management (grazing treatments, fences, and water) was determined by subtracting the additional amount produced by the treatment projects from the maximum amount of forage production realistically obtainable from each allotment (determined from the ecological site and clipping studies). In most cases, no additional forage could be expected from management alone. In these areas, the vegetation treatment projects would produce the maximum amount of forage that could be supported on a sustained basis. Additional forage increases expected from management are also shown on Appendix 4 for each allotment.

These potential production figures are the best available estimates and were used in the MFP to determine future forage allocations for wildlife and livestock. Although actual forage production would vary, the ratio of the proposed allocation would be maintained. That is, the percent allocated to cattle, sheep, and deer would remain the same. No increases in livestock use would be given until monitoring of forage production and resource conditions confirmed the availability of additional forage and the achievement of range management objectives.

APPENDIX 7

CULTURAL RESOURCES
MEMORANDUM OF UNDERSTANDING
RANDOLPH RANGE MANAGEMENT ENVIRONMENTAL STATEMENT
BETWEEN
THE BUREAU OF LAND MANAGEMENT
AND
THE STATE OF UTAH

I. PURPOSE

The Bureau of Land Management, hereinafter referred to as the Bureau, is preparing the Randolph Range Management Environmental Statement (Randolph ES) under the provisions of the National Environmental Policy Act of 1969. The Bureau has determined that cultural values could be damaged or lost as a result of actions proposed in the Randolph ES. The following kinds of actions are proposed on public lands administered by the Bureau:

a. Vegetation manipulation
b. Pipeline construction
c. Well drilling
d. Fence construction

The Utah State Historic Preservation Officer, hereinafter referred to as the State, is interested in assuring that cultural values in Utah be protected. The Bureau and the State have consulted and agree as to the measures, outlined in this agreement, which should be undertaken to protect these values should authorization be granted to use public lands in Utah administered by the Bureau for the purpose of any of the above-mentioned proposed actions. In this agreement, "cultural values" means data and sites which have archaeological, historical, architectural, or cultural importance and interest.

Investigators will be qualified to evaluate these "cultural resources". Qualifications of investigators will be submitted to the State Historic Preservation Officer.

II. AUTHORITY

This agreement is authorized under the Federal Land Policy and Management Act of 1976 and the National Historic Preservation Act of 1966. This agreement is in accord with Bureau policies and programs and does not abrogate nor amend any other agreement between the Bureau and the State.

III. RESPONSIBILITIES AND PROCEDURES

The Bureau will comply with 36 CFR 800 in identifying sites which are listed in or eligible for inclusion in the National Register of Historic Places.

A. As part of the planning and environmental analysis required prior to major grazing management decisions, the Bureau will search for archaeological and historical literature concerning the Randolph area. Literature and record searches have been conducted for all public lands that would be affected by the Randolph proposal. Sampling inventories have been conducted on 1 percent of the public lands that would be affected by the Randolph proposal.

B. After completing the planning and environmental analysis process, should the proposed management be implemented, the Bureau will enforce the following stipulations:

1. Prior to initiation of ground-disturbing activities, literature searches and intensive surveys will be undertaken on all areas which would be disturbed.

2. Whenever possible and feasible, cultural values will be avoided by construction and related activities. This will be accomplished mainly by regulating vegetation manipulation and adjusting the location of other facilities such as wells, pipelines, and fences.

3. A professional archaeologist may be required to be present when ground-disturbing operations are underway.

4. Subsurface cultural resources that are encountered during any construction will be salvaged if there is no other recourse in such a situation.

C. Wherever it is not possible and feasible to avoid sites that contain cultural values, the Bureau will consult with the State to determine the most satisfactory means of mitigating damage, as required by 36 CFR 800.

D. The Bureau will provide cultural resources reports, technical reports, and other pertinent material to the State.

E. The State will provide the Bureau with a letter, for use as an exhibit in the Randolph ES, to the effect that the procedures herein proposed by the Bureau, if correctly implemented, will satisfy the State's interest.

IV. The attached list identifies the specific actions that the Bureau anticipates will be included in the Randolph ES. The list may be brought up to date, as necessary, without amending this agreement in any way.

V. IMPLEMENTATION

A. This agreement will become effective on the date of the last signature on this agreement.

C. Any problems resulting from this agreement which cannot be resolved by the Bureau and the State will be referred to the Secretary of the Interior and the Governor of Utah for resolution.

1/19/79
Date

William [illegible]
Utah State Director
Bureau of Land Management
Department of the Interior

1/29/79
Date

Philip [illegible]
Utah State Historic
Preservation Officer

TABLE 1

Proposed Range Developments and Implementation Schedule by Allotment

Implementation Year		Improved Management Allotments	Public Land Acres Implemented	Vegetation Treatments			WATER DEVELOPMENTS				Fences		Total Maintenance Cost[c]	Total[d] Cost
				Acres[a]			Wells		Pipeline[b]					
Start	Finish			Spray	Burn	Cost	Number	Cost	Miles	Cost	Miles	Cost		
1	3	Dry Basin Pasture	2,625	0	0	0	0	0	0	0	0	0	0	0
1	6	Bear Lake	1,198	595	0	$ 4,165	1	$ 10,500	0	....	2	$ 3,000	$ 675	$ 18,340
1	6	Dry Basin	2,781	2,279	0	15,953	0	0	4	$13,200	6	9,000	1,110	39,263
1	6	Rabbit Creek	3,257	3,177	0	22,239	1	10,500	0	0	4	6,000	825	39,564
2	7	Kearl	1,183	479	0	3,353	3	31,500	0	0	4	6,000	1,875	42,728
2	7	Duck Creek	13,410	10,099	878	76,839	2	21,000	0	0	15	22,500	2,175	122,514
3	8	Laketown	3,241	215	7	1,554	2	21,000	0	0	9	13,500	1,725	37,779
3	8	Big Creek	20,346	13,211	1,975	106,302	4	42,000	0	0	12	18,000	3,000	169,302
3	8	Woodruff Pastures	19,250	11,206	1,675	90,167	1	10,500	3	9,900	0	0	0	110,567
4	9	New Canyon	30,665	9,987	100	70,609	3	31,500	0	0	13	19,500	2,550	124,159
4	9	East Woodruff	2,167	386	0	2,702	5	52,500	0	0	2	3,000	2,775	60,977
4	9	Meachum Canyon	1,951	1,557	0	10,899	1	10,500	0	0	3	4,500	750	26,649
5	10	Sage Creek	10,153	5,640	174	40,698	1	10,500	0	0	8	12,000	1,125	64,323
5	10	Twin Peaks	2,292	796	0	5,572	0	0	0	0	0	0	0	5,572
5	10	Stuart	1,042	488	263	5,257	0	0	1	3,300	0	0	165	8,722
		TOTAL	115,561	60,115	5,072	$456,309	24	252,000	8	$26,400	78	117,000	18,750	870,459

NOTE: Middle Ridge and Session Allotments are not included. Elimination of grazing is proposed to be completed within 6 years. Deseret, South Woodruff, and Eastman are not included. Proposed initial management would begin on the first year of implementation and continue until blocking of public lands makes improved management feasible.

This is the best estimate of an implementation schedule. The actual implementation sequence would depend on the willingness of the range users to cooperate and the availability of funding and manpower.

[a] Vegetation treatment by chemical spraying or burning would be acceptable (multiple use planning) on the acreages shown. The indicated costs are averaged based on treatment by either method. Spraying or burning at $7.00 per acre.

[b] Small watering troughs would be placed at predetermined intervals along pipeline.

[c] Cost per year for new projects only.

[d] Includes first year's maintenance cost.

STATE OF UTAH

Scott M. Matheson, Governor

DEPARTMENT OF DEVELOPMENT SERVICES

J. Phillip Keene III
Executive Director
104 State Capitol
Salt Lake City, Utah 84114
Telephone: (801) 533-5961

May 1, 1979

Paul Howard
ATTN: Don Cain
Bureau of Land Management
Division of Resources
University Club Building
136 East South Temple
Salt Lake City, Utah 84111

RE: Randolph Range Environmental Impact Statement

Dear Mr. Cain:

The staff has reviewed the Randolph Range Management Environmental Impact Statement and feel that so long as procedures outlined in the memorandum of understanding dated January 19, 1979 are followed, this project will have no known adverse effects on any potential or listed National Register site.

If you have any questions or concerns, please contact Jim Dykman, Preservation Archeologist, or Wilson Martin, Preservation Development Planner, at 307 West 200 South, Salt Lake City, Utah 84101, 533-6017.

Sincerely,

J. Phillip Keene III
Executive Director
and
State Historic Preservation Officer

WGM:br:C080:Multi

APPENDIX 8

Summary of Project Design Specifications

Seedings	Spraying and Burning	Water Developments (pipelines and troughs, springs, wells)	Fences
1. Assure success by examination of physical site factors such as slope, exposure, soil depth and erosion susceptibility before seeding and fences or water developments are constructed.	1. Examination of physical site factors.	1. Actual work in spring and stream beds done by hand where possible. If machinery was needed in these areas, rubber-tired tractors would be utilized to reduce damage.	1. Off-road vehicular traffic during construction would be held to a minimum.
2. Seed mixture required containing grass, forbs, and browse species. Seeding prescription would be tailored to each site[a] by BLM resource specialists.	2. Prescribed fire plan and spraying plan required that would identify application procedures, environmental conditions where allowed, controls and coordination responsibilities.	2. After construction of spring head boxes, troughs, pipelines, and well sites, the areas would be cleaned up and refuse removed.	2. Fence posts would be colored to blend in with surroundings except where visibility is required for safety.
3. After seeding, areas rested from livestock use at least 2 growing seasons or until perennial forage becomes established.	3. Projects would not exceed State and EPA pollution standards. Application of chemicals would conform to EPA regulation and BLM requirements.	3. Cuts, fills, excavations would be dressed and blended with surroundings. Pipelines would be buried where possible.	3. Where fences would cross existing roads, either gates or cattleguards would be installed.
....	4. Configuration and patterns would be in conformance with visual resource management guidelines.	4. Disturbed areas would be reseeded.	4. Gates would be installed along fence lines at regular intervals.
....	5. Steep drainages and areas within 0.5 mile of riparian areas, reservoirs, springs, livestock water developments, or sage grouse breeding grounds would not be treated. Juniper tree stands would not be treated.	5. Original water sources would be protected, fenced if required, and an off-stream source provided near the site.	5. Right-of-way clearance would be held to a minimum. Disturbed areas would be rehabilitated where possible.
....	6. Spraying would be done in the spring. Seedings may or may not follow on a case-by-case basis. Desirable plants in remnant population would determine need.	6. Size of storage tanks and troughs would be designed to accommodate expected needs of animals using each source.	6. In big game areas, fences would meet BLM manual wildlife specifications.
....	7. After determination of which acres would be treated by spraying in each allotment, an Environmental Assessment Record (EAR would be written on the analysis of application methods and chemical forms of 2,4-D to be used.	7. Overflow would be discharged from tank sites, wells cased to prevent cave ins, and well sites would be fenced.	7. .All fences would be in conformance with visual resource management guidelines.

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[a] Proposed forage composition for Winter Deer Range: grass 50 percent, forb 10 percent, browse 40 percent
Summer Deer Range: grass 65 percent, forb 10 percent, browse 25 percent

(continued)

APPENDIX 8 (concluded)

Seedings	Spraying and Burning	Water Developments (pipelines and troughs, springs, wells)	Fences
....	8. Burning would be conducted in the fall. Seeding would follow immediately.	8. Storage structures would be designed to provide water to wildlife (animals and birds). Drinking ramps would be installed and heights would not prohibit young animals from obtaining water.	....
....	....	9. Water development would be compatible with visual resource management guidelines.	9. Do not construct fences where natural barriers or rocky slopes could be used. This would reduce cost of fencing and amount of visual impact.
....	....	10. Do not construct water developments until seedings have been surveyed.	10. Pastures would not be fenced until sites for seedings are surveyed and seeding is successful.

[a] Proposed forage composition for Winter Deer Range: grass 50 percent, forb 10 percent, browse 40 percent
Summer Deer Range: grass 65 percent, forb 10 percent, browse 25 percent

APPENDIX 9

Soil Characteristics

Soil Series	Depth of Soil (inches)	Root Zone Restrictions	Surface Texture	Available Water Capacity (inches)	Erosion Hazard		Range of Average Slope (percent)	Runoff Potential	Production Capability[a] (pounds per acre per year)	Typical Vegetation
					Potential	If Vegetation Removed				
Upland Shallow Loam Keva-Kallis Gravelly Loam Solack Very Cobbly Loam FbE (unnamed map unit) Lundy Rock Outcrop Complex	Less than 20	None	Very fine sandy loam to silt loam. Rock fragments 0 to 40 percent	1.5 to 2.5	Moderate	High to Very High	5 to 60	High	1,500	Bluebunch Wheatgrass, Arrowleaf Balsamroot, Big Sagebrush, Low Sagebrush
High Mountain Loam (Aspen) Baird Hollow Silt Loam Lucky Star Gravelly Silt Loam	72+	None	Organic material 1 to 3 inches over loam	10 to 14.5	Low to Moderate	High	5 to 40	Low	3,000	Aspen, Bearded Wheatgrass, Columbia Needlegrass, Dryland Sedge
Upland Gravelly Loam Kearl Loam UbG (unnamed map unit) UpG (unnamed map unit) VaE (unnamed map unit) VaG (unnamed map unit)	72+ 30 to 40 40 to 60 72+	Bedrock None	Moderately coarse to medium-textured gravelly loam	4 to 6	Moderate to High	High to very High	3 to 20	Moderately Low	975	Bluebunch Wheatgrass, Mutton Grass, Nevada Bluegrass, Big Sagebrush
Alkali Bottoms Nevka Silt Loam	72+	Restricted by salts and high water table	Loamy fine sand to clay with loam	Water table between 20 to 40	Slight	Moderate	0 to 3	Moderately High to High	1,750	Salt Grass, Alkali Sacaton, Alkali Bluegrass, Basin Wildrye, Greasewood
Mountain Clay Hawkins Silty Clay Loam Yeates Hollow-Obray Complex	72+ 50 to 72+	None	Fine to moderately fine rock fragments may occur as a surface mantle.	High (specific amounts unknown)	Moderate	High	5 to 40	Moderately High to High	1,600	Slender Wheatgrass, Bluebunch Wheatgrass, Western Wheatgrass, Prairie June Grass
Mountain Gravelly Loam Sheep Creek Gravelly Loam	60+	None	Loams and sandy loams up to 40 percent cobbles in surface soils	5 to 7	Moderate	Very High	25 to 60	Moderately Low to Moderately High	1,375	Bluebunch Wheatgrass, Nevada Bluegrass, Mountain Mahogany, Bitterbrush
Mountain Loam Hades Silt Loam Despain Gravelly Loam Clegg Silt Loam	60+	None	Loam with stone or cobble occurring occasionally as a surface mantle	10 to 14	Low to Moderate	Moderate to Very High	10 to 50	Moderately Low to Moderately High	1,850	Bluebunch Wheatgrass, Basin Wildrye, Yarrow, Gambel Oak, Snowberry

[a] Production capability is expressed in dry weight of pounds of herbage produced per acre per year. This production is based on ecological climax production data obtained from SCS range site descriptions.

(continued)

APPENDIX 9 (concluded)

Soil Series	Depth of Soil (inches)	Root Zone Restrictions	Surface Texture	Available Water Capacity (inches)	Erosion Hazard		Range of Average Slope (percent)	Runoff Potential	Production Capability[a] (pounds per acre per year)	Typical Vegetation
					Potential	If Vegetation Removed				
Semidesert Loam	60+	None	Loam	10 to 12	High to Very High	Very High	Less than 10	Moderately Low	735	Bluebunch Wheatgrass, Needle-and-Thread grass, Squirreltail, Big Sagebrush, Sandberg Bluegrass
Pancheri Silt Loam										
RFA (unnamed map unit)										
RhD (unnamed map unit)										
Upland Stony Loam	60+									
Dennor Very Gravelly Loam	60	Bedrock	Gravelly, cobbly, or stony loam	3 to 5	Moderate to High	High to Very High	5 to 30	Low to Moderately High	975	Bluebunch Wheatgrass, Black Sagebrush, Black Sagebrush, Bitterbrush, Big Sagebrush
Jebo Very Gravelly Loam	30 to 40									
Sumine Stony Loam	30 to 40									
EdB (unnamed map unit)	40 to 60									
Semidesert Stony Loam	30 to 60	None	Stony or very stony loam	3 to 4	Moderate to High	Very High	0 to 10	Low to Moderately High	600	Indian ricegrass, Big Sagebrush, Black Sagebrush, Bluebunch Wheatgrass
Duckeree Gravelly Silt Loam										
Almar Very Gravelly Fine Sandy Loam										
Higham										
Mountain Stony Loam	60+	Some large rocks may restrict root growth	Very stony gravelly or cobbly loam	Moderately low (specific amounts unknown)	High	Very High	20 to 40	Moderately Low to Moderately High	1,500	Bluebunch Wheatgrass, Oniongrass, Bitterbrush, Big Sagebrush
Dagan Gravelly Loam (high percentage)										
Woodland Type	60+	None	Gravelly loam	Moderate (specific amounts unknown)	Slight	Very High	6 to 40	Low to Moderate	2,500	Lodgepole Pine, Douglas Fir
Condie Gravelly Loam										
Upland Loam	60+	None	Loam	9 to 12	Moderate to High	High to Very High	5 to 30	Moderately Low to High	1,475	Bluebunch Wheatgrass, Bitterbrush, Big Sagebrush, Rabbitbrush
Noeden Silt Loam										
Vfc (unnamed map unit)										
Ucd (unnamed map unit)										
Ant Flat Silt Loam										
Noeden Silt Loam										

NOTE: Data taken from individual mapping sheet, not woodland site.

[a] Production capability is expressed in dry weight of pounds of herbage produced per acre per year. This production is based on ecological climax production data obtained from SCS range site descriptions.

APPENDIX 10

Methodology Used to Determine Rangeland Suitability for Livestock Grazing in the Randolph Planning Unit

It is the policy of the Bureau (W.O. Instruction Memo 78-134 dated March 17, 1978) that all rangeland which is presently being grazed or has the potential to support grazing by livestock will be classified as to its suitability for such grazing use.

The major criteria used in suitability determinations for specific range sites are: (1) distance from water; (2) slope or other physical barriers; (3) forage production; and (4) soil surface factor (SSF).

The first three criteria are definite physical elements which can and do limit or prevent livestock grazing on a given area. The fourth criteria (SSF) is a watershed stability measurement. This is important because rangeland in a deteriorated watershed condition should not be grazed if such use accelerates soil erosion or damages the basic soil and vegetation resource.

The values for each of the four criteria constitute the recommended standard for the Bureau in determining range suitability. However, flexibility in the values may be allowed provided such deviations are justifiable and documented. Other factors such as class of livestock, season of use, etc., may be considered modifying factors in determining suitability. Each of the criteria is evaluated independently or in various combinations to arrive at three rangeland suitability classes - suitable, potentially suitable, and unsuitable. These suitability classes are described below:

Suitable Ranges are areas which can be grazed by livestock without damage to the soil and vegetation resources. Factors such as class of livestock, season of use, region, and location effect this classification.

Potentially Suitable Ranges are areas not currently suitable for livestock grazing because of (1) current erosion; (2) current low production of perennial forage; (3) current inaccessibility to livestock; and/or

(4) lack of water for proper utilization by livestock. These areas may be made suitable by application of appropriate chemical or mechanical treatment, seeding, natural improvement, or development of stock trails or water. However, the allocation of forage for livestock will not be made until such time as the area becomes suitable. In the Randolph Planning Unit, the principal limiting factor was determined to be distance from water. The proposed water developments (table 1-6) would make a total of 1,182 AUMs available in the long term (Appendix 4). Unsuitable Ranges are areas which are neither currently nor potentially suitable for livestock grazing because of (1) steepness of slope or other physical barriers; (2) current erosion or inherent erosiveness of the soil which cannot be corrected through treatment or management; (3) current low production of perennial forage with little or no potential through either treatment or management to improve production.

It is not anticipated that rangelands identified as "unsuitable" for livestock grazing would be fenced and all grazing prohibited except in unusual special conditions where threatened and endangered species, very critical habitat, and scenic beauty necessitate fencing as the only means of providing protection. Rather, unsuitable rangelands would not be given carrying capacity for domestic livestock. Additionally, no range improvements, e.g., water developments, would be located in unsuitable areas and no management actions, e.g., salting, would be taken which deliberately attract grazing animals into unsuitable rangelands. Tables 1, 2, and 3 indicate how suitablity determinations were made. Table 4 shows results of this determination for each allotment in the Randolph Planning Unit.

TABLE 1

Range Suitability Standards for Randolph Planning Unit

Suitability Element	Determination
1. Percent slope is greater than 50 percent	Unsuitable
1. Percent slope is less than 50 percent	
2. Current production of usable perennial forage is not sufficient to provide grazing capacity of less than 32 acres per AUM	
3. Potential production (either through management or treatment) of usable perennial forage is not sufficient to provide grazing capacity of less than 32 acres per AUM . .	Unsuitable
3. Potential production (either through management or treatment) of usable perennial forage is sufficient to provide grazing capacity of less than 32 acres per AUM	
4. Present SSF is greater than 60 SSF	
5. Potential SSF is greater than 60 SSF	Unsuitable
5. Potential SSF is less than 60 SSF	
6. Potential SSF is more than 40 SSF	
7. Slope greater than 20 percent	Unsuitable
7. Slope less than 20 percent	Potentially suitable
6. Potential SSF is less than 40 SSF	See table 2
4. Present SSF is less than 60 SSF	
8. Present SSF more than (less than 60) 40 SSF	
9. Potential SSF more than (less than 60) 40 SSF	
10. Slope greater than 20 percent	Unsuitable
10. Slope less than 20 percent	Potentially suitable
9. Potential SSF more than (less than 60) 40 SSF. .	See table 2
8. Present SSF less than 40 SSF	See table 2
2. Current production of usable perennial forage is sufficient to provide grazing capacity of less than 32 acres per AUM	
11. Present SSF is greater than 60 SSF	
12. Potential SSF is greater than 60 SSF	Unsuitable
12. Potential SSF is less than 60 SSF	
13. Potential SSF is more than 40 SSF	
14. Slope greater than 20 percent	Unsuitable
14. Slope less than 20 percent	Potentially suitable
13. Potential SSF less than 40 SSF	See table 2
11. Present SSF is less than 60 SSF	
15. Present SSF more than (less than 60) 40 SSF	
16. Potential SSF more than 40 SSF	
17. Slope greater than 20 percent	Unsuitable
17. Slope less than 20 percent	Potentially suitable
16. Potential SSF less than 40 SSF	See table 2
15. Present SSF less than 40 SSF	
18. Distance from reliable water is more than 4 miles	See table 2
18. Distance from reliable water is less than 4 miles	See table 3

Source: WO Instruction Memo 78-134, March 17, 1978.

TABLE 2

Suitability Determinations

Slope Percent	Distance Up Slope	Potentially Suitable or Unsuitable
0 to 20	to 4 miles	Potentially suitable
21 to 30	to 0.6 mile	Potentially suitable
	over 0.6 mile	Unsuitable
31 to 40	to 0.4 mile	Potentially suitable
	over 0.4 mile	Unsuitable
41 to 50	to 0.3 mile	Potentially suitable
	over 0.3 mile	Unsuitable
51		Unsuitable

Source: WO Instruction Memo 78-134, March 17, 1978.

TABLE 3

Suitability Determinations

Slope Percent	Distance Up Slope	Suitable or Unsuitable
0 to 20	to 4 miles	Suitable
21 to 30	to 0.6 mile	Suitable
	over 0.6 mile	Unsuitable
31 to 40	to 0.4 mile	Suitable
	over 0.4 mile	Unsuitable
41 to 50	to 0.3 mile	Suitable
	over 0.3 mile	Unsuitable
51		Unsuitable

Source: WO Instruction Memo 78-134, March 17, 1978.

TABLE 4

Suitability for Livestock Grazing

Allotment	Total Federal Acres	Cattle (acres) Suitable	Cattle (acres) Potentially Suitable	Cattle (acres) Unsuitable	Sheep (acres) Suitable	Sheep (acres) Potentially Suitable	Sheep (acres) Unsuitable
Bear Lake	1,198	1,138	0	60	1,198	0	0
Big Creek	20,346	16,211	1,538	2,597	18,221	1,089	1,036
Deseret	15,557	14,410	0	1,147	14,853	0	704
Dry Basin	2,781	2,715	0	66	2,781	0	0
Duck Creek	13,410	13,337	0	73	13,387	0	23
Eastman	3,405	3,341	0	64	3,345	0	60
East Woodruff	2,167	2,167	0	0	2,167	0	0
Kearl	1,183	1,183	0	0	1,183	0	0
Laketown	3,241	2,096	428	717	3,107	0	134
Meachum Canyon	1,951	1,754	76	121	1,872	0	79
Middle Ridge	1,286	1,286	0	0	1,286	0	0
New Canyon	30,665	28,872	0	1,793	30,566	0	99
Rabbit Creek	3,257	3,191	0	66	3,257	0	0
Sage Creek	10,153	6,805	2,277	1,071	9,490	0	663
Session	238	238	0	0	238	0	0
South Woodruff	4,251	3,899	0	352	4,027	0	224
Stuart	1,042	[a]1,005	0	37	[a]1,042	0	0
Twin Peaks	2,292	2,292	0	0	2,292	0	0
Woodruff Pastures	21,875	14,331	3,633	3,911	20,259	1,035	581
TOTALS	140,298	120,271	7,952	12,075	134,571	2,124	3,603

---

[a] Acres are suitable only as long as water is hauled.

APPENDIX 11

Methodology Used to Determine Apparent Trend for Vegetation

Table 1 shows the factors used to determine the apparent trend in livestock forage condition. Relative values for each factor are indicated by allotment. For any given factor, the higher the relative value, the more favorably this factor contributes to a positive (upward) indication of trend. For example in rating desirable plant vigor, a value of 7 is more favorable than a value of 3.

These ratings were made from direct field observations during field inventory work in 1976-77. Specific write-up forms are on file in the Salt Lake District by each allotment. The exact value assigned to each factor was a subjective interpretation made by the examiner. However, narrative guidelines (descriptions) were standard for each factor and aided the examiner in determing the approximate value in relation to the total scale of possible ratings. Figure 1 illustrates a sample form. The overall total score for apparent trend on table 1 corresponds to the values shown in Chapter 2.

TABLE 1

Apparent Trend Factors by Allotment (Average Values)

Allotment	Number of Obser- vations	Desirable Plant Vigor (Scale 0-10)	Desirable Plant Seedlings (Scale 0-10)	Surface Litter (Scale 0-5)	Pedestaling (Scale 0-5)	Gullies (Scale 0-5)	Total[a] Score (0-35)
Bear Lake	5	5.2	6.0	3.4	3.4	3.4	21.4
Big Creek	34	3.9	4.2	3.2	3.3	3.1	17.7
Deseret	34	4.9	4.2	3.4	3.1	3.9	19.5
Dry Basin	3	4.6	6.0	3.6	3.6	3.6	21.4
Duck Creek	7	4.4	4.8	2.7	3.4	3.7	19.0
Eastman	16	4.8	4.5	3.0	3.3	3.6	19.2
East Woodruff	6	5.3	4.3	4.0	3.8	4.0	21.4
Kearl	6	6.0	6.67	3.3	3.6	3.3	22.87
Laketown	9	7.3	6.9	3.6	3.9	3.9	25.6
Meachum Canyon	7	7.3	7.3	4.1	3.7	4.3	26.7
Middle Ridge	12	7.0	6.3	4.0	4.1	3.7	25.1
New Canyon	27	5.0	3.9	3.3	3.4	3.7	19.3
Rabbit Creek	4	5.0	4.75	3.5	3.0	3.0	19.25
Sage Creek	7	5.4	5.4	3.8	3.8	4.1	22.5
Session	3	5.3	3.7	3.3	3.3	4.7	20.3
South Woodruff	18	3.9	3.9	2.8	3.1	3.5	17.2
Stuart	4	2.8	2.5	1.3	3.3	3.5	13.4
Twin Peaks	1	4.0	4.0	3.0	3.0	3.0	17.0
Woodruff Pastures	25	4.4	4.5	2.7	3.0	3.0	17.6

[a] Total score between 26 to 35 = upward trend; 17 to 25 = static trend; 7 to 16 = downward trend.

OBSERVED APPARENT TREND

Examiner ______________________ Date ______________________

(Check appropriate box in each category which best fits area being observed).

VIGOR (10 points)	☐	Desirable grasses, forbs, and shrubs are vigorous showing good health. These plants should have good size, color, and produce abundant herbage.
(6 points)	☐	Desirable grasses, forbs, and shrubs have moderate vigor. They are medium size with fair color and producing moderate amounts of herbage, some seed stalks and seedheads are present.
(2 points)	☐	Desirable grasses, forbs, and shrubs have low vigor. They appear unhealthy with small size and poor color. Portions of clumps or entire plants are dead or dying. Seed stalks and seedheads almost nonexistent except in protected areas.
SEEDLINGS (10 points)	☐	There is seedling establishment of desirable grasses, forbs, and shrubs. Seedlings are present in open spaces between plants and along edges of soil pedestals. Few seedlings of invader or undesirable plants are present.
(6 points)	☐	Some seedlings of desirable grasses, forbs, and shrubs may or may not be present in open spaces between plants. Some seedlings of invader or undesirable plant species may or may not be present.
(2 points)	☐	Few if any seedlings or desirable grasses, forbs, and shrubs are being established. Seedlings of invader or undesirable plants are be present in open spaces between plants.
SURFACE LITTER (5 points)	☐	Surface litter is accumulating in place.
(3 points)	☐	Moderate movement of surface litter is apparent and deposited against obstacles.
(1 point)	☐	Very little surface litter is remaining.
PEDESTALS (5 points)	☐	There is little visual evidence of pedestalling. Those pedestals present are sloping or rounding and accumulating litter. Desirable forage grasses may be found along edges of pedestals.
(3 points)	☐	Moderate plant pedestalling. No visual evidence of healing or deterioration. Small rock and plant pedestals may be occurring in flow patterns.
(1 point)	☐	Most rocks and plants are pedestalled. Pedestals are sharp-sided with erosion often exposing grass roots.
GULLIES (5 points)	☐	Gullies may be present in stable condition with moderate sloping or rounded sides. Perennials should be establishing themselves on bottom and sides of channel.
(3 points)	☐	Gullies are well developed with small amounts of active erosion. Some vegetation may be present.
(1 point)	☐	Sharply incised V-shaped gullies cover most of the area with most of the gullies actively eroding. Gullies are mostly devoid of perennial plants with fresh cutting of the bottom.
TOTAL POINTS	____	Rating: 26-35 = Upward; 17-25 = Static; 7-16 = Downward

General Comments: ______________________________

FIGURE 1

Apparent Trend Form

APPENDIX 12

Background Information Used in Analysis of Aquatic/Riparian/Fisheries Habitats

Aquatic/riparian and fisheries habitats are probably the single most important habitat type in Rich County. They are also the areas where the greatest conflicts occur between uses such as livestock grazing, wildlife resources, watershed management, and recreation (Thomas et al., 1976).

The riparian habitats in Rich County are fairly uniform on BLM-administered public land. Most are characterized as small, shallow, meandering streams with distinct, narrow riparian zones, all of which are in poor existing condition from past livestock overuse. Nearly all of the streams are located within the sagebrush-grass plant community. All riparian zones on BLM lands in Rich County share several common characteristics: (1) they provide a critical source of habitat diversity in terms of vegetative composition and structure for native flora and fauna; (2) they are distinct wetland habitat zones surrounded by the more uniform sagebrush-grass community; (3) they comprise approximately 0.7 percent of the total land administered by BLM in Rich County; (4) they are much more productive in terms of both plant and animal biomass than any other habitats in the county; and (5) in general, all are in poor and declining condition with the exception of the Big Creek study exclosure (0.5-mile reach) protected from livestock since 1970.

In terms of value to wildlife, riparian zones receive significantly more use per unit area than any other vegetative type (Anderson and Ohmart, 1977; Kelly et al., 1975; Thomas et al., 1976). For example, in northeast Oregon, Thomas et al., (1976) reported that of 379 species of terrestrial animals known to occur in the Blue Mountains, 280 are either directly dependent on riparian habitats or require these areas for some function of their life cycles. Similar data for riparian habitats in Rich County are lacking; however, it is reasonable to expect a similar disproportionate value to wildlife exists in the area. As a result, riparian zones must be considered as fragile areas by managers if the proper balance in multiple use is to be achieved (McCluskey, 1978).

Impacts to these stream habitat resources and organisms as a result of livestock grazing are primarily due to the utilization of accumulated vegetation required for physical habitat maintenance, and to direct physical damage by trampling of streambanks (fig. 1). The ensuing effects of these actions result in decreased habitat productivity, stability, and fish carrying capacity as a result of accelerated bank erosion, increased streambottom sedimentation, reduced water quality, reduced spawning success, fish stock recruitment, decreased food (insect) production, and poor quality pools and riffles

Most of the streams in the Randolph area are located in allotments under either allotment-wide grazing as initial action or improved implemented grazing under long-term management. Streams and habitat impacts are shown under these actions in tables 1 and 2.

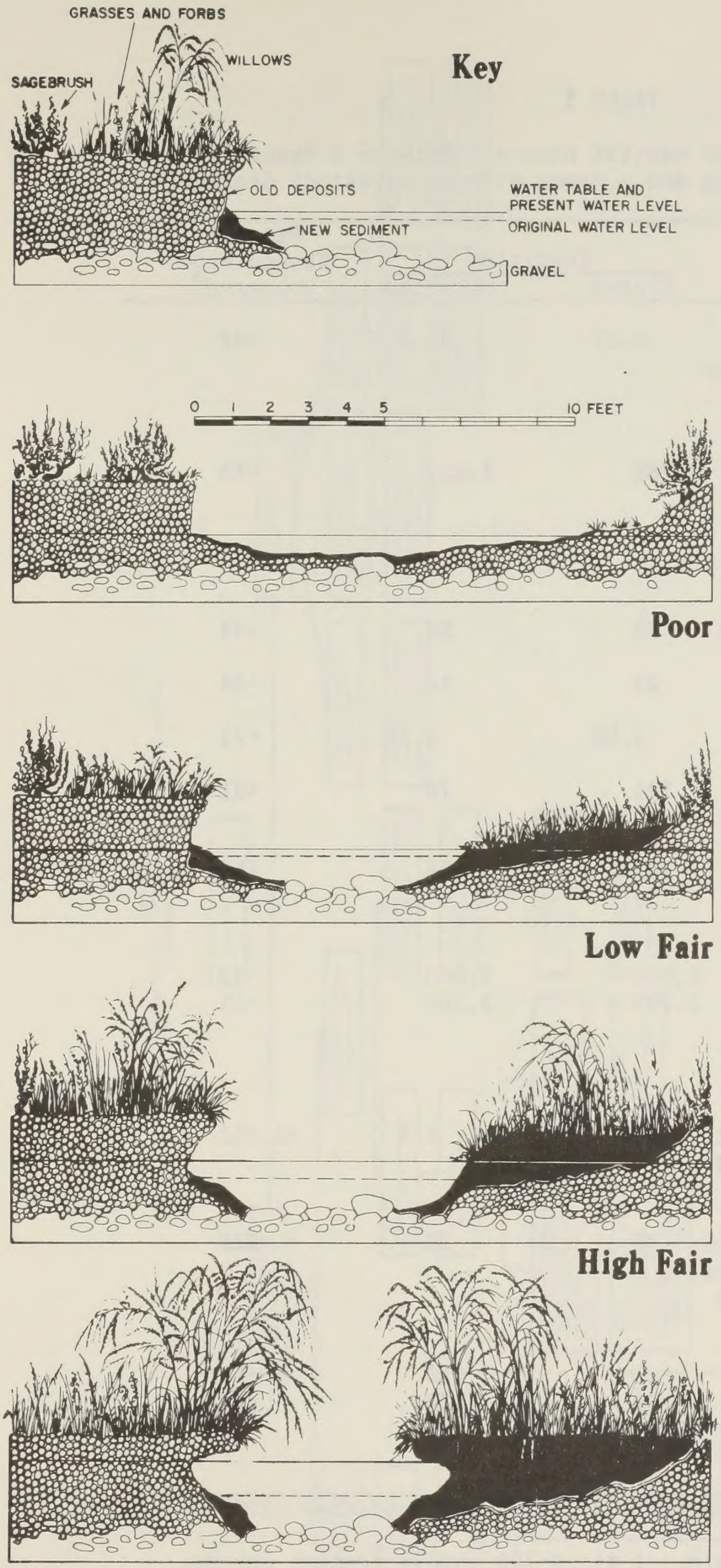
Since utilization of all aquatic/riparian streambottom zones by livestock would take place under initial and long-term management, with no riparian pasture zones except those few areas with protective fencing proposed, livestock concentrations would occur season long in streambottoms until they are "grazed out". Hormay (1976) states,

> "Vegetation in certain areas, such as meadows and drainage ways are invariably closely utilized under any stocking rate or system of grazing. Such use may be detrimental to wildlife, aesthetic or recreational or other values. Where this is the case, about the only way to preserve values is to fence the area off from grazing. Reducing livestock or adjustng the grazing season usually will not solve such a problem."

Livestock Grazng - Historical Patterns

As an introduction to the analysis, a brief discussion of the historical patterns of livestock grazing is provided by Ames (1977):

> "Cattle exhibit a strong preference for the riparian zones for a number of reasons. Cattle prefer the quality and variety of forage available. Riparian forage is higher in palatability because it has more moisture in it whether it be shrubs,



Poor

Channel wide, shallow and easily warmed by full exposure to solar radiation. Low bank stability with active bank erosion. Riparian vegetation quite limited, sagebrush to the streambank in many areas. Low riparian water table. Bottom sediment approaches 60%+, smothering gravel deposits. Habitat for aquatic or terrestrial wildlife essentially nil. Similar to conditions of heavy grazing impact.

Low Fair

Riparian vegetation begins to form on silted bars and banks forming a sediment trap which builds up banks and begins to confine the channel. Water surface still fully exposed to warming, but level begins to rise, forcing out riparian sagebrush and bringing back riparian vegetation. As flow becomes confined, sediment is reduced to 40-60%. Conditions similar to those of moderate grazing pressure. Willow growth depressed. Habitat value to aquatic or terrestrial wildlife is still quite limited.

High Fair

Semi-confined by development of riparian vegetation with dense root mass. Banks stabilized by vegetation and bottom sediment reduced to approximately 20-30%. Rising water table is reducing sagebrush in favor or riparian grass shrubs. Stream continues deepening as bank resistance to erosion increases. Pools and riffles for fisheries are improving as more gravel is exposed. Representative of light grazing pressure.

Good

Confined-deep channel, elevated riparian water table, fully developed vegetation in riparian zone stabilizing cutbanks, deposited sediment and over hanging banks. Physical cover highly developed for both aquatic and terrestrial organisms. Bottom gravels clean with only 10-15% sedimentation. Reduced water temperatures due to 40-60% shading of surface area. Similar to conditions of very limited grazing or protected areas.

Adapted from "Guidelines for Management of Trout Habitat in Wisconsin," 1967.

FIGURE — 1

EFFECTS OF CATTLE GRAZING ON TROUT HABITAT

TABLE 1

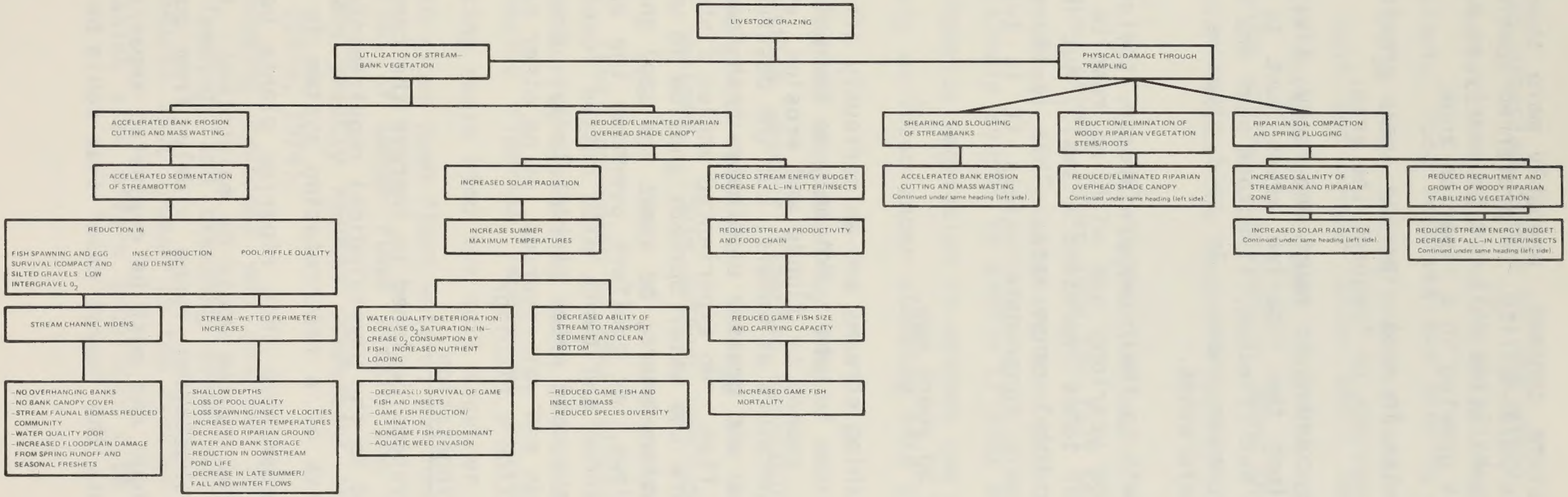
Comparison of Stream Habitat Elements Between A Reach Under Season-Long Grazing and a Reach Without Livestock Grazng

Stream Habitat Element	Condition		Percent Change From Ungrazed[a]
	Grazed	Ungrazed	
1. Riparian Shrub Volume (cubic meters of aerial volume per square meter of ground surface)	6.67	85.3	-92
2. Overhead Cover (total number of units such as overhanging shrubs, undercut banks, etc., per acre of stream surface)	2,289	4,037	-43
3. Channel Habitat (percent of channel area with riffles	78	54	+44
or pools and runs)	21	46	-54
4. Average Depth (feet)	1.06	1.34	-21
5. Average Channel Width (feet)	141	74	+91
6. Average Water Width (feet)	103	66	+56
7. Streambank Vegetation			
Before flood	1,593	3,000	-47
After flood	1,305	3,366	-61
(feet of streambank covered with vegetation per mile of stream)			
8. Streambank Erosion (feet of streambank eroding per 100 feet of streambank)	19	1.3	+1,362
9. Channel Movement (percent of channel length that changed position in the streambottom)	77	18	+328
10. Standing Crop of Fish			
Brown Trout	63	213	-70
Other Fish	52	122	-57
(pounds of fish per acre of stream surface)			

Source: Adapted from Marcuson (1970 and 1971 and Gunderson (1968).

[a] Grazed divided by ungrazed minus 1 times 100 equals Percent Change.

TABLE 2
ASSOCIATED IMPACTS ON STREAM AQUATIC/RIPARIAN AND FISH HABITAT FROM LIVESTOCK GRAZING


LIVESTOCK GRAZING
UTILIZATION OF STREAM-BANK VEGETATION
PHYSICAL DAMAGE THROUGH TRAMPLING
ACCELERATED BANK EROSION CUTTING AND MASS WASTING
ACCELERATED SEDIMENTATION OF STREAMBOTTOM
REDUCTION IN
FISH SPAWNING AND EGG SURVIVAL (COMPACT AND SILTED GRAVELS: LOW INTERGRAVEL 0₂
INSECT PRODUCTION AND DENSITY
POOL/RIFFLE QUALITY
STREAM CHANNEL WIDENS
STREAM-WETTED PERIMETER INCREASES
-NO OVERHANGING BANKS
-NO BANK CANOPY COVER
-STREAM FAUNAL BIOMASS REDUCED COMMUNITY
-WATER QUALITY POOR
-INCREASED FLOODPLAIN DAMAGE FROM SPRING RUNOFF AND SEASONAL FRESHETS
-SHALLOW DEPTHS
-LOSS OF POOL QUALITY
-LOSS SPAWNING/INSECT VELOCITIES
-INCREASED WATER TEMPERATURES
-DECREASED RIPARIAN GROUND WATER AND BANK STORAGE
-REDUCTION IN DOWNSTREAM POND LIFE
-DECREASE IN LATE SUMMER/FALL AND WINTER FLOWS
REDUCED/ELIMINATED RIPARIAN OVERHEAD SHADE CANOPY
INCREASED SOLAR RADIATION
INCREASE SUMMER MAXIMUM TEMPERATURES
WATER QUALITY DETERIORATION: DECREASE 0₂ SATURATION: INCREASE 0₂ CONSUMPTION BY FISH: INCREASED NUTRIENT LOADING
-DECREASED SURVIVAL OF GAME FISH AND INSECTS
-GAME FISH REDUCTION/ELIMINATION
-NONGAME FISH PREDOMINANT
-AQUATIC WEED INVASION
DECREASED ABILITY OF STREAM TO TRANSPORT SEDIMENT AND CLEAN BOTTOM
-REDUCED GAME FISH AND INSECT BIOMASS
-REDUCED SPECIES DIVERSITY
REDUCED STREAM ENERGY BUDGET: DECREASE FALL-IN LITTER/INSECTS
REDUCED STREAM PRODUCTIVITY AND FOOD CHAIN
REDUCED GAME FISH SIZE AND CARRYING CAPACITY
INCREASED GAME FISH MORTALITY
SHEARING AND SLOUGHING OF STREAMBANKS
ACCELERATED BANK EROSION CUTTING AND MASS WASTING Continued under same heading (left side).
REDUCTION/ELIMINATION OF WOODY RIPARIAN VEGETATION STEMS/ROOTS
REDUCED/ELIMINATED RIPARIAN OVERHEAD SHADE CANOPY Continued under same heading (left side).
RIPARIAN SOIL COMPACTION AND SPRING PLUGGING
INCREASED SALINITY OF STREAMBANK AND RIPARIAN ZONE
REDUCED RECRUITMENT AND GROWTH OF WOODY RIPARIAN STABILIZING VEGETATION
INCREASED SOLAR RADIATION Continued under same heading (left side).
REDUCED STREAM ENERGY BUDGET: DECREASE FALL-IN LITTER/INSECTS Continued under same heading (left side).

> forbs, or grass. Moisture content, probably more than any other factor, influences palatability. A preferred species of forage growing on a dry hillside will not be nearly as palatable as the same species growing in a riparian zone.
>
> Availability of water in most riparian areas provides a strong influence for livestock to frequent the area.
>
> If the surrounding country is rough and rocky, livestock tend to concentrate along the riparian areas just to give their feet a rest. In hot climates, livestock seek the shade available along the riparian areas. In cold climates, they seek shelter from the cold winds.
>
> If livestock are left to their own preference, the riparian zones get continued yearlong use with no respite from grazing. These critical zones represent a small, but important percentage of the total range area. This is where the nongame birds and animals congregate unless it is totally devastated."

J. Stockley Ligon wrote 50 years ago,

> "Cold water fish and fishing streams are as seriously affected by overgrazed watersheds as is game. Not only do the extremes of low and high water, caused by floods and erosion, affect the normal flow and temperature of waters, but the destruction of willows, alders, weeds and grasses eliminates both food and shelter for cold water fish. No experienced angler fishes in sun-exposed streams where the water spreads shallow in unprotected flood-ravished watercourses; he seeks the cool shadows where the alders, willows, or conifers overhang the banks, where the stream is narrow and banks with matted roots are secure along New Mexico's cold water streams today. Abuse by overgrazing of watersheds and watercourses, as no other cause, has deteriorated New Mexico's fishing."

Grazing Effects on Riparian Vegetation

Site specific grazing systems designed to improve the conditions of range plants are not tailored to the physiological requirements of woody riparian plants. The success of a rest-rotation system in improving range vegetation does not guarantee that riparian plants bordering a stream within pastures of the system would be maintained. Results of rest-rotation on riparian vegetation range widely from positive to negative. Each case is unique and must be evaluated separately. The following discussion documents the "worst case" that could be expected.

Grazing riparian plants at the wrong times and heavily utilizing riparian plants can cause the riparian area to decline and not recover. In woody plants, food reserves and growing points which are located on stems and twigs are exposed and available to grazers. Grazing these plants in fall and winter after their food reserves are stored and during their dormant period can limit the ability of the plant to regrow the following spring. Removal of more than 60 percent of crown can significantly reduce the regrowth potential of some species (Hormay, 1970).

Generally, riparian vegetation begins growth earlier in the spring and continues growth later into the fall than most upland range plants. During this time, the plants are more palatable than dried range plants and are actively sought by cattle (Platts and Rountree, 1972). Because of this, riparian vegetation in meadows and along streamsides is invariably closely utilized under stocking rate or system of grazing (Hormey, 1976).

Two studies conducted by Platts and Rountree (1972) and Eckert (1975) question whether riparian vegetation can be restored on previously overgrazed pastures through the use of rest-rotation grazing management systems. These authors concluded that riparian vegetation receiving 1 year of rest in a rest-rotation system did not recover adequately, thus, according to their findings, in some cases, pastures may recover during a yearlong rest, but streambanks do not.

Streamside riparian vegetation provides soil (bank) stability. Water-seeking roots bind the soil together and the above-ground vegetative growth slows down flood waters, catches eroding silt and provides a concentration of water flows within the stream channel. Slowing of flood waters greatly reduces streambank erosion, which reduces stream siltation (Otis, 1974).

Overhanging branches and grasses in the water provide natural nesting, feeding, and breeding areas for terrestrial and land stage aquatic insects that appear in the diet of stream fish. This overhanging vegetation also offers excellent fish hiding places (Otis, 1974).

Boussu (1954) and Platts and Rountree (1972) consider the most beneficial characteristics of streamside vegetation to be the cover it furnishes to aquatic organisms, stabilizing streambanks and overhanging shrubs, thereby providing hiding places for fish.

Streamside riparian vegetation also serves to buffer light penetration and water temperatures on small streams (Minckley, 1963). Many studies have shown that extensive removal of riparian cover can seriously increase water temperature (Tebo, 1974). Leaves of streamside plants provide shade during the hot summer period, which reduces light levels and water temperatures. The leaves, twigs, and other organic vegetative material that fall into small streams are a major source of energy to these ecosystems (Hynes, 1970; McConnell, 1968).

Thus, we find in the literature that streams are often energy dependent upon the riparian vegetation and the watershed. Likens and Bormann, 1974, have demonstrated the nutrient linkages between streams and watersheds. They state clearly that the key to wise management of aquatic ecosystems is wise management of the watershed.

This concentration of animals and intensity of use would result in the utilization or reduction of shading and stabilizing streambank vegetation, especially palatable shrubs and young trees (Tuinstra, 1967), plus extensive physical damage through trampling. The primary effects of these actions would result in the following changes in stream habitat:

1. The reduction of the natural fish holding and rearing capacity of streams through the reduction or elimination of protective overhanging vegetative cover (table 1 illustrates the comparison of stream habitat elements between a reach under season-long grazing and a reach protected from grazing in a Montana study). Figure 1 shows effects of livestock grazing on streambank vegetative cover.

Studies on Big Creek in the ES area (Duff, 1978) have shown that after 4 years of rest and recovery inside a stream study exclosure, stream habitat condition was set back 4 years to its previous condition, and channel stability was set back 2 years when trespass livestock were moved into the exclosure for a period of only 6 weeks.

On Otter Creek, western Nebraska, a significant rainbow trout fishery had been virtually eliminated because of impaired habitat conditions, but within 3 years after fencing to eliminate livestock, the stream had recovered enough to allow for rainbow trout to begin building up their population again (VanVelson, 1977).

2. The increase in summer temperature maximums through the reduced shading of streams. This would tend to lower oxygen saturation levels of water within the stream and at the same time, increase metabolic rates (oxygen consumption) of fish. This would also limit the carrying capacity for game fish species and favor nongame or rough fish which have a wider tolerance range for both increased temperatures and lower oxygen levels (Lagler, 1971; Lagler, Bardach, and Miller, 1962).

3. The reduction of stream energy budgets and productivity for food organisms (insects) through the reduction or loss of vegetative litter which would normally fall into the stream from the overhanging grass, shrub, or tree canopy and be consumed by decomposer and detritus-feeding organisms (Hynes, 1973).

4. The acceleration in rates and degrees of streambank erosion as much as 1,362 percent (table 1) which would create the following effects:

a. Increase levels of streambottom sedimentation, especially during times of increased summer temperature maximums, as warmer water has less capacity for carrying sediment and would, therefore, develop more extensive sediment deposition (Hynes, 1973). Also, salmonid eggs (trout) have been found to experience a general mortality of 85 percent when as little as 10 to 20 percent of the voids in a spawning redd become filled with sediment (Bell, 1973). Sediment sampling in Big Creek (Duff, 1978) has shown that the percent of fine sediments passing through the 0.84 mm sieve average 27 percent, indicating poor spawning habitat.

b. Accelerate the rate of channel movement through reductions in the physical accumulation of vegetation required for the development of streambanks with a high resistance to erosive streamflows.

c. Effect an overall net change in game fish populations as a result of the combined effects of alterations to aquatic stream habitat. Duff (1978) found trout numbers to increase by 570 percent in an ungrazed area compared to an immediately adjacent grazed area on Big Creek within the ES area.

Other literature sources relate similar impacts to aquatic riparian habitats and fisheries from livestock grazing.

Kennedy (1977) indicates grazing is a significant force in altering streamside vegetative composition, just as it is throughout the watershed. Trees and other vegetation in the riparian zone control sediments, provide stream stability, and tend to narrow and deepen channel morphology, which benefits the fishery resource.

Although fish are not restricted to streams with riparian vegetation, the presence or absence of streamside cover affects temperature, which determines species composition (Patton, 1977).

A number of studies (Marcuson, 1970; Duff, 1977; Lorz, 1974) have shown that fish production is much lower where grazing occurs in the riparian zone. Behnke (1977) indicates, "The focal point of conflict concerns the fact that livestock tend to concentrate along streambottoms leading to excessive use and eventual destruction of riparian vegetation, which in turn, leads to destabilized streambanks and altered stream channels."

Further, Behnke and Zarn (1976) cite grazing as one of the principal factors contributing to the decline of native trout in the west. Their assessment is that, "Grazing livestock may destroy the vegetative cover and cave in overhanging bank, thereby eliminating the most important trout habitat. Loss of streambank vegetation leads to increased water temperatures, erosion and silting, elimination of spawning sites, and reduction of food supplies in the stream, all of which drastically degrade trout habitat."

As an example of how habitat alteration can collectively have an adverse impact on trout, information reported by Marcuson (1977) is applicable. In Rock Creek, Montana, populations of brown trout (Salmo trutta) were compared in a heavily grazed zone and in a natural area. Within the natural area, there were 1,880 (213 pounds) of trout per acre compared to 701 (63 pounds) per acre where heavy grazing occurred. Weightwise, the standing crop was 3.4 times greater in the natural area and fish in excess of 8 inches long were 300 percent more abundant than in the heavily grazed zone.

In a draft publication entitled, "Livestock Grazing Management and Water Quality Protection" (BLM-EPA, 1978), BLM and EPA document and discuss the problem that " . . . the riparian zone is frequently mismanaged and essentially unprotected from improper livestock grazing".

The numbers of cattle using the vast western ranges and pastures have increased constantly since 1875 (Wagner, in press). As a result of increased forage use and changes in or eradication of natural vegetation, much rangeland has been altered (Alderfer and Robinson, 1974; Lusby et al., 1971; Sartz and Tolstead, 1974). Altered range conditions have adversely affected riparian environments, streambanks, stream channels, and water quality, and this degradation has caused the management of rangelands to emerge as a critical environmental issue.

Bakke (1977) observes that loss of trout and salmon habitat from overgrazing has long been a frustrating problem in Oregon. Saltzman (1976) charges that overgrazing and irrigation are the most serious and least understood ecological problems in the western States. (Gallizioli (1977) reports that in Arizona, the single most important range management problem limiting the attainment of potential fish and wildlife benefits is overgrazing by livestock. Bowler (1976) believes overgrazing is the largest environmental problem in the United States.

Kimball and Savage (1977) reported a 425-percent increase in the fish census in a section of Diamond Fork Creek, Utah, after livestock had been kept away for 4 years and forage utilizatin was reduced 60 percent from past use once grazing was resumed. The installation of stream improvement structures and the planting of willows and grasses within the study area helped accelerate habitat recovery and accounted for a part of the increase in the number of fish collected. McGowan

(1976) doubts that present grazing strategies are capable of solving the problems in the aquatic environment caused by grazing, because unless grazing systems are willing to recognize the values of aquatic-riparian habitats, livestock will continue to remain in that succulent vegetation along the creeks.

Sediments settle into spaces between gravel in which trout eggs are incubated. As a result, intergravel water flow is impeded and developing embryos do not receive adequate quantities of dissolved oxygen, which has an adverse impact on development and survival.

Bjornn (1973), after conducting field work with steelhead trout (searun rainbows), reported that for sand and gravel mixtures, less than 25 percent of the eggs developed to the emergent fry stage when sand concentrations approximated 30 percent, compared to an excess of 75 percent emergence in concentrations less than 20 percent. Work of Corley (1976) also related to effects of sediment on reproductive success.

In general, for trout to be successful, temperatures should not exceed the mid-60s during summer periods. For critical phases of the life cycle, such as spawning and hatching, they are less tolerant (table 3). High temperatures can be lethal to trout directly, making them susceptible to diseases because of stress, inhibit reproductive success, and adversely affect spawning migrations (Lantz, 1971).

TABLE 3

Temperature Data for Trout

	Range (°F)		
Species	Optimum	Spawning	Hatching
Rainbow	54 to 66	36 to 68	55 (optimum)
Brook (fall spawner)	47 to 52	38 to 45	39 to 54
Brown (fall spawner)	39 to 70	50 (optimum)	36 to 52
Steelhead	45 to 58	39 to 49	50 (preferred)
Cutthroat (Salmo clarki)	49 to 55	43 to 63	40 to 55

Source: Bell, 1973.

Water temperatures in small streams associated with rangelands commonly exceed 80° F when vegetation is eliminated by grazing, and conditions for trout become unsuitable. These streams are particularly susceptible to harmful temperature alterations because, as in logged areas, potential for change is directly proportional to the amount of stream surface area which becomes exposed and indirectly proportional to the discharge (Brown, 1973). The importance of vegetative cover is of such a high priority that some fisheries experts concerned about problems caused by livestock recommend that most small streams should have at least an 80 percent canopy to promote acceptable temperatures (Platts, 1977, 1978).

In addition to temperature effects, streamside vegetation also provides cover for trout. This fact has been recognized for some time by fishermen and students of animal behavior. One investigator (Boussu, 1954) documented influences of cover in a small stream in South Dakota within experimental sections. The placement of cut brush by hand to simulate natural willow cover in density and position resulted in an increase of trout poundage by 258.1 percent.

The works of White (1973) and Wesche (1973, 1972) also document the relationships of channel morphology, undercut banks, and adequate cover to trout abundance.

From a fishery habitat standpoint, positive effects of rest periods and the subsequent increase in ground cover of riparian vegetation would have little effect on the overall stability or productivity of the aquatic ecosystem. Since grazing sequences would follow the rest periods, removal of vegetation, and physical disturbance of the stream habitat would negate any positive benefits derived from the rest (Platts and Rountree, 1972, 1978; Eckert, 1975). Continued use of riparian streambottoms eliminates essentially all reproduction as soon as it becomes established (Davis, 1977). Winegar (1973) suggests uninhibited plant growth appears to be the key to the functions of the stream community.

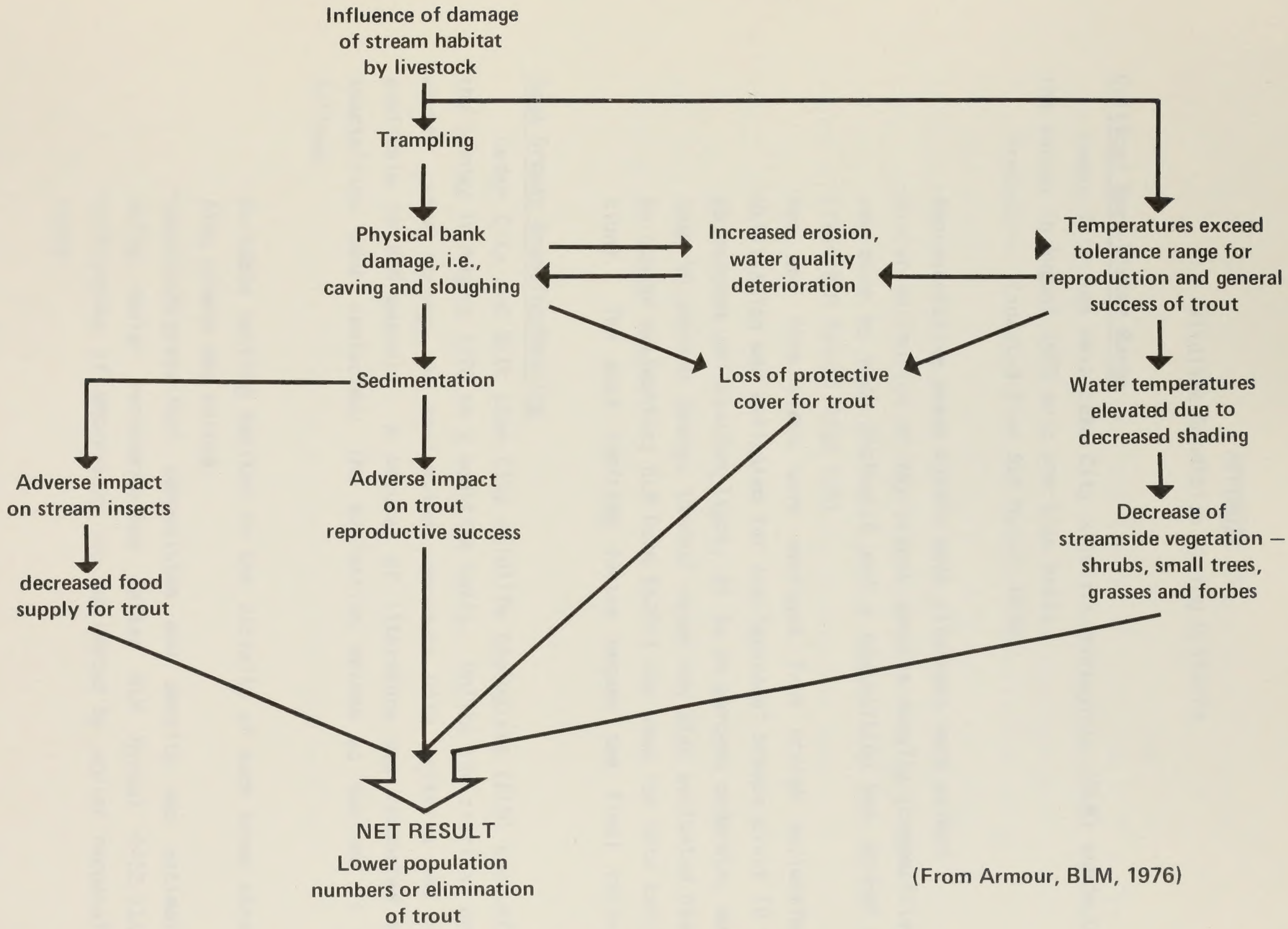
Constant fluctuation in the condition of the fisheries habitat would not add to its stability or have a measurable effect on improving its productivity since disturbance and impacts received when these areas are grazed after being rested would continue to be limiting factors.

Available research indicates that overgrazing in associated watersheds creates higher peak storm flows. Overgrazing combined with hydraulic force of these peak storm flows, plus the grazing by cattle on young seedlings, keeps many streams in a young, undeveloped, and raw condition.

Figure 2 shows a conceptualized flow chart of adverse effects of stream habitat damage by livestock on trout populations.

Platts (in press) states that, "since livestock are attracted to the riparian zone, overuse has resulted. The importance of the riparian zone is demonstrated in Utah where within 21 million acres of land managed by the Bureau of Land Management, only 0.1 percent is riparian. These limited riparian habitats are key factors in supporting associated resources."

Thus, aquatic/riparian habitats and associated fisheries cannot be expected to be significantly improved under the proposed actions, except in stream protection areas, as season long grazing use with insufficient rest periods wuld not allow for the establishment of shade-producing riparian vegetation nor the stabilization of streambanks and overland sediment flows, upon which these aquatic riparian flora and fauna resources depend for maintenance and survival.


Influence of damage of stream habitat by livestock
Trampling
Physical bank damage, i.e., caving and sloughing
Increased erosion, water quality deterioration
Temperatures exceed tolerance range for reproduction and general success of trout
Sedimentation
Loss of protective cover for trout
Water temperatures elevated due to decreased shading
Adverse impact on stream insects
Adverse impact on trout reproductive success
Decrease of streamside vegetation — shrubs, small trees, grasses and forbes
decreased food supply for trout
NET RESULT
Lower population numbers or elimination of trout

(From Armour, BLM, 1976)

FIGURE 2

CONCEPTUALIZED FLOW CHART OF ADVERSE EFFECTS OF STREAM HABITAT DAMAGE BY LIVESTOCK ON TROUT POPULATIONS

APPENDIX 13

Wildlife Condition Rating Criteria

Critical Deer Winter Range

Cedar City and Salt Lake City wildlife biologists (BLM) conducted the survey in August 1978 on a one-time basis.

Procedure: (adapted from BLM Manual 6630)

- -Representative areas within each allotment were walked.
- -Ocular estimation of key browse species density (composition) was made by each biologist and a composition was agreed on (from BLM Manual 4412.11A).
- -Age and form class were averaged from ocular estimation.
- -Utilization was estimated for the "average" browse plant (0 to 25 percent utilization light, 25 to 50 percent moderate, more than 50 percent heavy; thermal cover was also evaluated based on ocular estimation; BLM Form 6635-1 was used for data tabulation). The most limiting factor became the final rating.

Sage Grouse Breeding/Nesting

Cedar City and Salt Lake City wildlife biologists (BLM) conducted the survey in August 1978 on a one-time basis. Unlike the critical deer winter range survey, an evaluation procedure with criteria was not available in BLM manuals. A perusal of literature was conducted and specialists were contacted; the evaluation method as devised is as follows:

- -Suitable nesting habitat in the vicinity of each known strutting ground was walked.
- -Sagebrush/grass-forb composition and density was estimated using ocular reconnaissance (after BLM Manual 4412.11A).
- -Utilization of understory was estimated by ocular reconnaissance

-Criteria for rating:

1) Sagebrush canopy
good more than 20 percent
fair 10 to 20 percent
poor less than 10 percent
(adapted from June, 1963; Western States Sage Grouse Committee, 1974; Klebenow, 1970)

2) Forb/grass density
good more than 25 percent
fair 10 to 25 percent
poor less than 10 percent
(adapted from June, 1963)

3) Sagebrush height
good more than 50 percent under 25 inches
fair _____
poor more than 50 percent under 25 inches
(adapted from June, 1963; it should be noted that the only sites evaluated had proper sagebrush heights)

4) Utilization
good less than 50 percent by volume
poor more than 50 percent
(personal communication Dwight Bunnel, UDWR Upland Game Specialist, Salt Lake City, Utah)

-the most limiting factor became the final rating.

APPENDIX 14

Fishing Quality Evaluation Rating Procedures

The following chart was taken from BLM Manual 6111, Quality Evaluation of Recreation Use Opportunities. This particular Quality Evaluation Chart covers recreational fishing in streams and lakes. Each key factor (left hand column) is evaluated according to the rating criteria. An explanation of rating criteria is listed below the chart. Each key factor is given a score (from 3 to 0), the scores are added up, and the total score gives an indication of the quality of recreational fishing on each stream or lake rated. Additional instructions are also listed below the chart.

QUALITY EVALUATION CHART

FISHING

KEY FACTORS	RATING CRITERIA AND SCORES		
WATER FLUCTUATION	Good	Fair	Poor
Score _____	3	2	1
CONTAMINATION	Uncontaminated and clear	Lightly contaminated or murky	Polluted or muddy
Score _____	3	2	1
FISH POPULATION	High	Moderate	Low
Score _____	3	2	1
PROPAGATION	Natural propagation	Supplemented hatchery stocking required	Put and take operation
Score _____	3	2	1

Total Score _____ A = 11-12 B = 8-10 C = 4-7

INSTRUCTIONS

Purpose: To rate the quality of experience a fisherman can expect while fishing in a given body of water.

How to Identify Fishing Values: Consider all water bodies having the capability of sustaining fish.

How to Determine Minimum Suitability: Rate all water bodies and stream segments having access from BLM lands except sterile bodies of water such as Great Salt Lake.

How to Delineate Rating Areas: Consider the following factors:

a. Similarity of stream or lake conditions.

b. Similarity of fish populations and species.

c. Similarity of habitat. There may be portions of lakes or reservoirs where habitat conditions are dissimilar enough to be rated as a separate unit. For example, a shallow finger of a reservoir that has a large number of partially submerged stumps which make it ideal habitat, could be delineated as a separate rating area.

EXPLANATION OF RATING CRITERIA

Water Fluctuation

Good

Stream or lake is stable. There is little drawdown or flooding during the season.

Fair

Not managed for optimum fishing conditions. The stream or lake is subject to flooding or drawdown, mostly during season of light use.

Poor

Subject to flooding or drawdown during heavy use season.

Contamination

Uncontaminated

Free from harmful chemicals and bacteria. Objects are distinguishable 24 inches below the surface.

Contaminated

Contains a limited amount of undesirable chemicals or bacteria but not sufficient to affect the edibility of the fish. Objects can be recognized between 8 to 24 inches from the surface.

Polluted

Polluted to the point where it is questionable if the fish are edible. Objects are not distinguishable below 8 inches.

Fish Population

Fish Population

Both the number and type of fish are considered in this criteria. The higher quality type fish includes all trout species, bass, pike, and others as determined on a local basis. Lesser species include herring, catfish, bluegill, carp, sucker, and others.

High

Supports a high population of one or more species of the better warm or cold water game fish, or a moderate population of an unusual sporting fish such as steelhead, or a moderate population of very large "trophy" fish. A "high population" is a relative factor that must be determined on the local level. The rater should identify an area which he considers high and use this as a base.

Moderate

Supports a moderate population of one or more of the better game species or a high population of less desirable species.

Low

Supports a low population of large fish or a large population of very small fish.

APPENDIX 15

Capital Permit Values

Collateral worths of a grazing permit from a lending institution's point of view (personal communication with Federal Land Bank) depends on a combination of the ranch property's appraised value, its level of dependence on nonranch owned grazing capacity, and its existing debt load. A common method of determining a ranch's potential borrowing power for the Rich County area is:

$$L = (0.7)(1-f)(A)$$

where

L = the potential loan amount

0.7 = the ceiling on the maximum amount of the property value which can be held as collateral

f = an adjustment factor for ranch dependence which can range from 0 for a totally self-contained ranch to 0.40 for a ranch totally dependent on BLM for grazing.

Therefore, for a totally debt-free ranch appraised at $200,000, the maximum loan which could be attained would be about:

$$L = (0.7)\ (1 - 0.175)\ (\$200{,}000) = \$115{,}500$$

If $10,000 worth of that ranch's appraised value is in its livestock and the rancher receives a 20-percent reduction, the new maximum loan amount would be:

$$L = (0.7)\ (1 - 0.175)\ (\$200{,}000 - [1 - 0.20]\ [10{,}000] = \$110{,}880$$

This represents a 4-percent reduction. As can be seen, the reduction would affect the appraised value of the ranch, but would not affect the level of the ranch dependence on BLM grazing.

Sales value for a permit can be expressed by the equation

$$CV = \frac{(F_p - F_f)}{i} + F_f$$

where

CV = the capital value of the permit

F_p = the private grazing fee (this has been established at about $6.76 per AUM for the Intermountain West)

F_f = the Federal grazing fee ($1.89 per AUM)

i = the going mortgage interest rate

Therefore, if the going interest rate is 10 percent, then the maximum capitalized value would be about:

$$CV = \frac{\$6.76 - \$1.89}{0.10} + \$1.89 = \$50.59 \text{ per AUM}$$

If other factors hold constant, the capitalized value will vary inversely with the mortgage interest rate: the higher the rate, the lower the capital value and vice versa. Also, the greater the magnitude of the difference between the private and Federal fees, the greater the capital value of the permit and vice versa.

In general, the relationship expressed in the above equations will probably hold as a maximum. That is, on a financial basis, the rational buyer would be unwilling to pay more than this capital value for a permit because he could obtain higher returns on his investment elsewhere. The precise figure, $50 or some other value, may vary depending on local demand for range capacity, the difference between private and Federal grazing fees (on a local basis), and the prevailing market interest rate.

APPENDIX 16

Information Used to Assess Probable Impacts to Vegetation

BACKGROUND INFORMATION USED TO PREDICT TERRESTRIAL IMPACTS

1. Spring Grazing

Several authors have pointed out the effects of grazing (or clipping to simulate grazing) on the condition of forage species. The research seems to indicate that early spring use is the most damaging to the plant, when continuously grazed during the growing season of the plant. Stoddart et al (1975) states that, " . . . the early growing season is the critical one, both from the standpoint of vegetation and the grazing animal. If it is at all possible, grazing should not take place at this time so that forage plants could recover from dormancy and provide sufficient forage for the grazing animal".

Cook (1966) found that early spring grazing can lead to depleted carbohydrate root reserves, and that "Carbohydrate reserve exhaustion can be the primary cause of changes in range condition. The more palatable species are grazed more intensively and frequently than unpalatable plants. The carbohydrate reserves in the heavily grazed plants are gradually reduced while the less palatable species have optimum reserves."

Cook (1971) also found that "Desert plants will not tolerate heavy and continuous spring use because they do not have an opportunity for regrowth and carbohydrate replenishment during the dry summer." It was established in this study that spring clipping of forage species resulted in more death loss of plants, a reduction in crown size, and fewer seedstalks than plants clipped while in dormancy.

Continuous grazing during the growing season of the plant results in adverse impacts to the plant as a result of the interruption of the normal growth and reproductive functions of the plant. "To sum up the result from continued season-long grazing: where there is enough stock to use all the forage each year, the requirements of plant growth are seriously interferred with, the forage crop becomes weakened and is materially decreased, little or no seed is produced, reproduction is, therefore, prevented, and there is a gradual decline in the carrying capacity of the range." (Sampson, 1913, as abstracted in Hickey, 1966.)

However, plant needs can be at least partially met by grazing after the plant has finished its growth for the season. The vigor of plants after 2 or 3 years of grazing only after seed maturity was little different from the vigor of the same species protected from grazing. However, there was a marked difference in the vigor of species either grazed after seed maturity or not grazed at all, and the vigor of the same species grazed year after year during the growing season (Douglas, 1915, as abstracted in Hickey, 1966).

Reardon and Merrill (1976) found that of a number of grazing systems evaluated, continuous grazing at light intensity resulted in the highest yield of increaser plants (usually undesirables). Decreaser plants (usually desirables) had the highest yields on pastures grazed in a deferred rotation.

Range extension specialists at Utah State University in Logan have indicated that if grazing was delayed until sometime between the six-leaf stage and flowering of the key species, use at proper stocking levels could be made that would maintain the composition and vigor of the key species when grazed year after year. This period of grazing would begin around June 21 in an average year if bluebunch wheatgrass (Agropyron spicatum) was the key species (personal communication, Busby and Banner, 1978).

Mason (1963) stated that when using bluebunch wheatgrass as the key species, the range is ready for grazing when the plant has reached a height of 4 inches when grazed in a system providing periodic rest, or when 7 inches tall under continuous grazing. The author gave the approximate dates of May 1 to May 10 and May 10 to May 15, respectively, for a site in central Utah. Moderate grazing with these turn-on dates should maintain the health of the range according to the author.

2. Intensity of Grazing

Heavy grazing also has an adverse impact on forage species. Cook (1966) found that heavy grazing reduces the amount of roots and rhizomes and, if continued for several years, kills the plant.

Other authors have pointed out the need for conservative stocking rates. Stoddart et al (1975) says, "If economically full use is made of forage in good years, overgrazing must result in poor years. We cannot be sure that overuse in one year can be compensated by underuse in another year; hence, stocking that would result in correct use in the average year may not suffice." Smith (1895) said that "The maximum number of cattle that can safely be carried on any square mile of territory is the number that the land will support during a poor season. Whenever this rule is ignored, there is bound to be loss."

Busby and Banner (personal communication, 1978) indicated that the stocking rate should be based upon 75 percent of the plant production in a normal year. This would allow overuse of the vegetation only in years of extremely poor plant production. This overuse may be compensated for by the light use in years of normal and above normal production.

3. Rest

Factors other than just season and intensity of use affect livestock forage species. Hormay (1970) states that periodic complete growing seasons rest from grazing is required to maintain forage condition. This periodic rest allows the plant to store carbohydrates, produce seed, and establish seedlings. Without this periodic rest from grazing, the grazing habits of livestock are such that " . . . livestock graze the range selectively by species and areas. They consistently graze the more palatable plants and accessible areas closely, and invariably, beyond proper use level. The pattern of use is very uneven, but much the same from year to year. Plants grazed closely one year tend to be grazed closely the next. So under continuous grazing at any stocking level, the more palatable and accessible plants are gradually killed out" (emphasis added). It is obvious from Hormay's work that regulating stocking rate alone would not ensure proper use of the vegetation. A system of grazing use must be established that provides for the phenological requirements of the plants.

However, periodic rest of the range will not compensate for severe grazing during the vulnerable periods in the life cycle of a plant. Mueggler (1975) indicates that 6 to 8 years of protection from grazing may be required for bluebunch wheatgrass in low vigor to restore normal vigor. Sosebee et al., (1977) says that 4 years or more of rest may not be sufficient to overcome the adverse effects of 1 or 2 years of severe grazing to the vigor of the plants. This severe grazing can occur when livestock numbers are "doubled up" on areas of an allotment as other areas within the allotment are rested from use. As August Hormay said, "Rest-rotation grazing does not call for heavy grazing under any grazing treatment" (letter from Hormay to Rock Springs District Manager, BLM 9/1/76), "No system of grazing will be effective unless safe use of key forage species is observed" (Anderson, 1967). Studies on crested wheatgrass (*Agropyron cristatum*) in Nevada indicated that 1 year of rest would not compensate for abusive grazing the year before (Robertson et al., 1970). It would appear that even under a grazing system, a conservative stocking rate is necessary.

4. Grazing Systems

Studies evaluating the effects of grazing systems on the vegetation are not conclusive in many cases. In some cases, conflicting results and conclusions were reached by different studies on the same type of grazing system.

There are two main grazing systems that would permit the proposed season of use and still provide the amount of rest indicated as necessary. This would be either some form of deferred rotation or rest-rotation grazing system.

Relatively little research has been published relative to field trials of either system. The deferred rotation systems were commonly three or more pastures, the classic rest-rotation system involves five pastures, with a four-pasture system reported also.

However, a relative abundance of published information is available as to the effects of spring deferrment of grazing on the vegetation. As both grazing systems make use of spring deferrment, information will be covered for deferred grazing as well as grazing systems.

"The fastest way to improve deteriorated range having sufficient cover for natural reseeding is through complete growing season deferrment" (Hickey, 1966). Studies on big sagebrush-bunchgrass ranges in southern Idaho produced the recommendation that " . . . deferring all grazing until fall for a period of several years on successive portions of the range is recommended for obtaining maximmum improvement of depleted range" (Craddock and Forsling, 1938 as abstracted in Hickey, 1966).

Hormay and Evanko (1958 as abstracted in Hickey, 1966) stated that 1.5 seasons of rest may be necessary to ensure seed production on most bunchgrass ranges in California, and on similar ranges in other parts of the west. In addition, another year of rest was required to assure establishment of seedlings after germination, with areas receiving less than 15 inches of precipitation yearly probably better off with 2 years' rest to establish seedlings, in addition to the 1.5 seasons rest to restore vigor and produce seed.

Mueggler (1975) found that Idaho fescue (Festuca idahoensis) plants clipped at 75 percent of herbage volume at the flowering stage of development produced almost no flower stalks the following season, even though protected from grazing. Herbage volume was also reduced 35 percent over unclipped plants the year after clipping. During the second year of protection, flower stalk production was still less than 50 percent that of the unclipped plants.

After three years of protection, herbage production and flower stalk production returned to the levels of unclipped plants.

In the same study, clipping 50 percent of total herbage production just before full emergence of flower stalks caused bluebunch wheatgrass (Agropyron spicatum) plants to produce only 50 percent of the herbage production and 10 percent of the flower stalks in the year following clipping as compared to unclipped plants. After 5 years of rest following clipping, herbage and seed stalk production was only 66 percent of the control level. The author concluded that 6 to 10 years of rest may be needed for moderately low vigor bluebunch wheatgrass (Agropyron spicatum) to fully recover seedstalk and herbage production as compared to unclipped plants.

Johnson (1965 as abstracted in Hickey, 1966) found average utilization to decrease under rest-rotation grazing on cow ranges, with an increase in plant cover. This decrease in utilization from rest-rotation grazing (and theoretically deferred rotation), is probably due to higher forage yields. Mid grasses and annual forbs are found to yield significantly higher under deferrment and harvesting at the end of the growing season than under frequent clipping (Lang and Barnes, 1942 as abstracted in Hickey, 1966).

In a review of current literature on grazing systems, Gifford and Hawkins (1976) could find no evidence that any grazing system consistently or significantly increases plant and litter cover on watersheds, or that there was any net increase in watershed protective cover. It does appear, however, that individual species may increase or decrease in density due to the grazing system, while maintaining the overall density of the plant community.

Any grazing system that establishes grazing and resting periods based on "average" plant phenology is likely to allow grazing too early in a number of years. Studies in Stoddart et al., (1975) found that the same phenological stages varied as much as 47 days from year to year in central Utah and in southeastern Idaho as much as 36 days over a 9-year period. Thus, a turnout date or grazing system based on average plant phenology could allow grazing too early in relation to phenological stage of development in those years where development is later than average.

The rate at which the range can improve appears to be quite slow. McLean and Tisdale (1972) found that 20 to 40 years of complete rest was required for range to recover excellent range condition after overgrazing. On poor condition range, 10 years' rest yielded little change in condition, and it was found that the change in condition from poor to fair took longer than the change from fair to good.

5. Vegetation Treatments

Only late summer or fall burns to control big sagebrush will be considered. This would appear to be the best time to burn for a number of reasons. Valentine (1971) recommends burning big sagebrush at least 10 days after perennial grass seed is ripe and scattered and after the leaves are nearly dry. Linne (1978) states that late summer or fall burns are the least harmful.

Stoddart et al., (1975) states that woody nonroot-sprouting shrubs can be controlled by fire if enough ground fuel is present to carry the fire. After burning, ranges should be protected from livestock grazing so that undesirable species do not gain a competitive advantage and increase in composition at the expense of the desirable species. If the land is normally climax grassland, then burning and proper grazing should prevent big sagebrush from reestablishing dominance. However, if the land is normally dominated by big sagebrush, it will come back after treatment. Since the area of the ES (Rich County) is included in Garrison et al., (1977) as being in the sagebrush ecosystem, it will probably reinvade the treatment sites and reestablish dominance. Indeed, Harniss and Murray (1973) found after 30 years of observation that sagebrush reinvaded a burn site in spite of good grazing management. The area of the burn was in sagebrush-grass range.

Table 1 (after Valentine, 1971; Linne, 1978) summarizes the effects of late summer and fall burning on some species common to the ES area.

Linne (1978), in reviewing the fire literature found that rhizomatous grasses tend to increase in relation to other species after burning. Generally, increases in production on burned areas continued to be above normal for about 30 years. Forbs are generally unaffected by fall burning since they are already dried out by this time. Table 2 summarizes data on time required for recovery of several species following burning presented by Linne (1978).

TABLE 1

Effect of Fall Burning

Severely Damaged	Slightly Damaged	Undamaged	Enhanced
Big Sagebrush (*Artemisia tridentata*)	Bluebunch Wheatgrass (*Agropyron spicatum*)	Cheatgrass (*Bromus tectorum*)	Rabbitbrush (*Chrysothamnus* sp.)
Bitterbrush (*Purshia tridentata*)	Indian Ricegrass (*Dryzopsis hymenoides*)	Crested Wheatgrass (*Agropyron cristatum*)	Gambel's Oak (*Quercus gambelii*)
Broom Snakeweed (*Gutierrezia sarothrae*)	Nevada Bluegrass (*Poa nevadensis*)	Prairie June-grass (*Koeleria cristata*)	Horsebrush (*Tetraoymia* sp.)
Curlleaf Mountain Mahogany (*Cerocarpus leoifolius*)	Penstemon (*Penstemon* sp.)	Sandberg Bluegrass (*Poa sandbergii*)	....
Eriogonym (*Eriogonym* sp.)	Squirreltail (*Sitanion hystrix*)	Snowberry (*Symphoricarpos oreophilus*)	....
Idaho Fescue (*Festuca idahoensis*)	Astragalus (*Astragalus* sp.)	True Mountain Mahogany (*Cerocarpus mountanus*)	....
Pussytoes (*Antennaria* sp.)	Globe Mallow (*Aphaeralcea* sp.)	Western Wheatgrass (*Agropyron smithii*)	....
Phlox (*Phlox* sp.)	Serviceberry (*Amelanchier* sp.)	Yarrow (*Achillea lanulosa*)	....
Needle-and-Thread (*Stipa comata*)	....	Intermediate Wheatgrass (*Agropyron intermedium*)	....

TABLE 2

Recovery Rates Following Burning

Species	Comments
Bluebunch Wheatgrass (Agropyron spicatum)	Normal production reached 1 to 3 years following burn
Needle-and Thread (Stipa comata)	Normal production reached 3 to 8 years following burn
Idaho Fescue (Festuca idahoensis)	Twelve to 30 years required for complete recovery
Prairie June-grass (Koeleria cristata)	Three to 8 years required for recovery
Big Sagebrush (Artemisia tridentata)	Ten percent of normal production after 12 years, normal production after 30 years
Bitterbrush (Purshia tridentata)	Fifty to 60 percent of normal after 15 years, 30 to 40 years required for complete recovery
Rabbitbrush (Chrysothamnus sp.)	Reduce 1 to 3 years after burn, three times normal after 12 years; on sandy soils, four to nine times normal after 8 to 18 years
Horsebrush (Tetradymia sp.)	Fifty percent reduction 1 year after burn, two times normal after 3 years, five times normal after 12 years
Serviceberry (Amelanchier sp.)	Thirty to 50 years to return to normal

Nielsen and Hinckley (1975) reported that burning a sagebrush-grass range had resulted in a 70-percent increase in grazing capacity, but where artificial seeding followed burning, increases of 5 to 12 times in grazing capacity were noted. In another study in Nielsen and Hinckley (1975), they reported that a 67 to 100-percent kill could be expected on big sagebrush (*Artemisia tridentata*) if proper recommendations for use are followed. They also reported moderate to heavy damage of serviceberry (*Amelanchier* sp.) plants, and kills on bitterbrush (*Purshia tridentata*) plants less than 12 inches tall.

The authors also reported that on Utah ranges at 5,200 to 6,500 feet elevation, spraying of big sagebrush (*Artemisia tridentata*) resulted in a doubling of the production of forage species. Bitterbrush (*Purshia tridentata*) plants greater than 12 inches tall were only slightly damaged if sprayed at the time of leaf origin or before. Also, on a mountain loam site in Rich County where the precipitation was greater than 15 inches annually, a four-fold increase in production of forage species was noted 3 years after spraying. However, on a 7 to 9 inch precipitation zone at 6,800 feet elevation in Wyoming, benefits as a result of spraying started decreasing after 5 years following spraying. After 14 years, benefits from treatement were negligible, and after 17 years, the big sagebrush (*Artemisia tridentata*) was denser than before treatment.

Valentine (1971) reports that big sagebrush (*Artemisia tridentata*) control in Idaho with 2,4-D resulted in high topkill of quaking aspen (*Populus tremuloides*) and snowberry (*Symphoricarpos* sp.), but was followed by resprouting by both species. The author also states that "Eradication of large acreages of undesirable range plants by herbicides is seldom possible." The treated areas are reinfested by a number of means. Treating only parts of a pasture, usually accomplished by alternating sprayed and unsprayed strips, also contributed to reinvasion by undesirable plants due to selective grazing on the sprayed sites. The author contends that the entire pasture unit should be treated, or the sprayed area fenced-off and managed separately for a period of a few years. Also, adequate control may require retreatment the following year after initial treatment.

It is not possible to treat all noxious species with one spraying. Due to differences in phenological development, the correct time for spraying big sagebrush (Artemisia tridentata) is usually 2 to 3 weeks earlier than that required to treat rabbitbrush (Chrysothamnus sp.). Thus spraying for big sagebrush may only topkill the rabbitbrush causing it to resprout and increase in density on the site.

BACKGROUND INFORMATION USED TO PREDICT AQUATIC/RIPARIAN IMPACTS

Several authors have pointed out the degradation to the vegetation of the aquatic/riparian community caused by livestock grazing and other disturbing factors. However, relatively little research has been done on how to protect and restore these communities. Behnke et al., (in press) predicted the following impacts to aquatic/riparian habitat as a result of different grazing systems.

Grazing Management Strategy	Habitat Rating
1. Season long	1. Poor
2. Deferred	2. Poor to fair
3. Deferred rotation	3. Poor to fair
4. Rest-rotation	4. Poor to variable
5. No grazing	5. Good to excellent

The authors felt that resource damage, especially bank cutting, caused by heavy use in the rest-rotation system, may not be repaired within the rest portion of the cycle. They also felt that a rest-rotation system might maintain a healthy streamside community, but it is unlikely to restore a degraded one within 10 years.

Yet another author reported, "It has been our experience on the Coronado Forest, that there is no known system of livestock management that will give adequate protection to a riparian zone. Even short term use or seasonal use is inadequate." And further, "The only way we have been able to insure adequate protection of our riparian types is by fencing them out from livestock use" (Ames, 1977).

August Hormay (letter to Rock Springs) said, "Vegetation in certain areas, such as meadows and drainage ways are invariably closely utilized under any stocking rate or system of grazing. Such use may be detrimental to wildlife, esthetic or recreational or other values. Where this is the case about the only way to preserve values is to fence the area off from grazing. Reducing livestock or adjusting the grazing usually will not solve such a problem."

Methodology Used to Determine Impacts

The following tables 3 and 4 illustrate the methods used to document vegetation impact analyses for both initial and long-term proposals. In the interest of saving space, the methodology used in the analyses is illustrated herein only for one allotment under initial action and one allotment under long term management so that the reader can have a clear idea of the steps followed. The process, however, was repeated in its entirety for each of the 19 allotments for both initial and long-term management. Completed tables indicating results obtained for all 19 allotments are on file in the Cedar City District Office.

The purpose of the analysis process was to predict impacts to vegetation. To do this, each element of the proposed action that would cause changes to the existing situation was identified (these elements are called change agents). Examples of change agents are adjustments to existing livestock numbers and seasons of use. Next, specific resource parameters were identified that could be affected by a given change agent. Available literature was then evaluated to determine a specific impact.

Once all the impacts were defined for the individual change agents, a further analysis was made to determine if there were any cumulative or additive effects of the impacts, or if the impacts may offset each other. A specific example of the analysis of impacts for the initial action (table 3) follows for the Big Creek Allotment.

Change agents in the proposed initial action management include a range readiness turn-on, a reduction in grazing intensity, riparian fencing to exclude livestock grazing, and disposal of public land.

Range Readiness Turn-On

Under the present fixed turn-on, grazing is bound to occur too early in some years, just at the point of range readiness in some years, and after range readiness occurs in other years, due to normal climatic factors. In this context, range readiness is defined as the particular physiologic state at which the forage plant is least susceptible to harm from grazing (Appendix 5).

Under the modified range readiness turn-on proposed, grazing could only occur too early some years, or just at the point of range readiness in other years, again due to normal climatic factors.

The literature was examined to find notation of what effects grazing before range readiness (too early) or after range readiness (too late) may have on vegetation. Stoddart et al (1975), Cook (1966), Cook (1971), and Douglas (1915, as abstracted in Hickey, 1966) all indicate negative impacts to carbohydrate reserves, range condition, seedstalks, crown size, plant mortality, grazing capacity, and vigor, caused by too early grazing in the spring. Delaying grazing until range readiness occurs (or after) should not cause negative mpacts. The longer grazing is delayed after range readiness occurs, the more advantageous it would be for the plant since carbohydrate (food) storage would be improved.

The next step used in the analysis process would be to consider how this information relates to the proposed management and existing conditions on the Big Creek Allotment. Under the existing fixed turn-on date (May 10), with its combination of too early and too late grazing, there is an offsetting of negative and positive impacts. However, under the modified range readiness turn-on proposed (Chapter 1), grazing would not occur after range readiness, but could still occur before range readiness. There would be no positive impact to offset the negative effects caused by grazing before range readiness. Hence, an overall negative impact resulted from the range readiness turn-on date. As pointed out earlier, this would cause negative impacts to range condition, plant mortality, carbohydrate reserves, vigor, and grazing capacity. These negative impacts were predicted to cause declines in livestock forage condition, apparent trend, desirable plant vigor, composition, and density, and livestock forage production. However, since desirable plant vigor was already in the lowest class (poor), further reduction is not possible.

Reduction in Intensity of Use

A 20-percent reduction in the intensity of livestock grazing, to reduce an existing overgrazing situation is proposed. Data in Cook (1966), Stoddart et al (1975), and Smith (1895), indicate conservative stocking rates must be followed because overuse of vegetation leads to reduced root mass and increases in plant mortality. This generally indicates a reduction in plant vigor. It was assumed that a reduction in grazing intensity from 65 to 54 percent) would cause an improvement in the above factors. Positive impacts resulting from lowered intensity of use would be predicted to cause an improvement in livestock forage condition, a decline in utilization, a slight improvement in composition and density, and an increase in livestock forage production.

Riparian Fencing to Exclude Livestock Grazing

Proposed riparian fencing (59 acres) would not significantly affect vegetation condition in the remainder of the allotment, other than to reduce the amount of forage available for livestock. Improvement in vegetation cover would occur within the fenced area.

Disposal of Public Land

Disposal of public land would have no effect on vegetation resources in the allotment, other than to reduce the amount of forage available to livestock and the number of total acres in the categories of livestock forage condition and apparent trend shown in table 3.

The next step in the analysis process is to determine the cumulative effects of the various impacts. The improvement in livestock forage condition due to the reduction in grazing intensity would be offset by the decline in condition caused by the modified range readiness turn-on. Hence, no change in present condition was predicted. Similarly, the decline in apparent trend, composition densities, and livestock forage production due to the range readiness turn-on were offset by improvements to these same factors resulting from the reduction in intensity of use. The loss of forage due to riparian fencing and land disposal had a cumulative effect, thus lowering the proposed initial stocking level.

TABLE 3

Initial Action Impacts to Vegetation

Allotment and Area Affected	Proposed Management Action	Change From Present Management	Resource Category	Present Resource Condition	Probable[a] Impact	Reason for Impact
Big Creek Allotment-wide	Change in season of use to accommodate range readiness turn-on date for livestock	Present turn-on date fixed at 5/10. Possible earlier or later turn-on date estimated to be 5/10-5/15, but no later than 6/1 in any case.	Livestock forage condition	CATTLE 7,125 acres good 13,117 acres fair 104 acres poor 0 unsuitable SHEEP 14,802 acres good 5,544 acres fair 0 acres poor 0 unsuitable	 No change Decline No change No change No change Decline No change No change	Initiating livestock grazing by 6/1 each year may allow grazing to occur too early some years. This would cause depletion of carbohydrate reserves in desirable forage species (Appendix 16 narrative).
			Apparent trend	0 acres up 12,392 acres static 7,954 acres down 0 unsuitable	No change Decline No change No change	
			Desirable plant vigor	Poor	No change	
			Utilization of key species	65%	No change	
			Composition and density	44% density 25% grass 10% forbs 65% shrubs	No change Decline Increase Increase	
			Livestock forage production	2,809 cattle AUMs 430 sheep AUMs	Decline	
Big Creek	Change in intensity of grazing	The 20% reduction in grazing use would allow for greater carbohydrate storage, reproduction, and root growth of desirable plants.	Livestock forage condition	CATTLE 7,125 acres good 13,117 acres fair 104 acres poor 0 unsuitable SHEEP 14,802 acres good 5,544 acres fair 0 acres poor 0 unsuitable	 No change Improve No change No change No change Improve No change No change	Heavy grazing reduces carbohydrate storage in desirable plants and this can to undesirable changes in range condition (Appendix 16 narrative).
			Desirable plant vigor	Poor	No change	

[a] Units for Probable Impact are the same as corresponding figures under Present Resource Condition.

(continued)

TABLE 3 (continued)

Allotment and Area Affected	Proposed Management Action	Change From Present Management	Resource Category	Present Resource Condition	Probable[a] Impact	Reason for Impact
Big Creek (continued)			Livestock forage production	2,809 AUMs cattle 430 AUMs sheep	Loss of 51 cattle AUMs and 8 sheep AUMs	
	Disposal of 321 acres of public land	321 acres less rangeland available for multiple use (livestock grazing)	Livestock forage condition	CATTLE 7,125 acres good 13,117 acres fair 104 acres poor 0 unsuitable	 7,017 good 13,008 fair 0 poor No change	The disposal of 321 acres would cause a loss of 56 AUMs for cattle, and 8 AUMs for sheep to the allotment due to the land no longer being available for Federal grazing. No other resource categories would be affected.
				SHEEP 14,802 acres good 5,554 acres fair 0 acres poor 0 unsuitable	 14,641 good 5,384 fair No change No change	
			Apparent trend	0 acres up 12,392 acres static 7,954 acres down 0 unsuitable	No change 12,231 static 7,794 down No change	
			Desirable plant vigor	Poor	No change	
			Utilization of key species	65%	No change	
			Composition and density	44% density 25% grass 10% forbs 65% shrubs	No change No change No change No change	
			Livestock forage production	2,809 AUMs cattle 430 AUMs sheep	Loss of 56 AUMs cattle, 8 AUMs sheep	
Big Creek Allotment-wide (overall summary)	Initial adjustment in livestock use	Less intensive use, variable turn-on date, riparian fencing, and land disposal.	Livestock forage condition	See Above	CATTLE 7,017 acres good 13,008 acres fair 0 acres poor	See Above
					SHEEP 14,641 acres good 5,384 acres fair No change No change	

[a] Units for Probable Impact are the same as corresponding figures under Present Resource Condition.

NOTE: Except where noted, acres within condition and trend categories did not shift to the next category. The probable impact indicates direction. It is likely that all acres in each categor shift within a resource condition as indicated by impact.

(continued)

TABLE 4

Long-Term Impacts to Vegetation

Allotment and Area Affected	Proposed Management Action	Change From Present Management	Resource Category	Resource Condition after Initial Action	Probable Impact	Reason for Impact
Big Creek Allotment-wide	Deferred treatment during growing season	Periodic rest would be provided to key forage species. At least 1 year rest out of every 3 years would be provided to pastures during critical spring growing period (until 6/30). At least 1 year rest out of every 5 would be provided until seed ripe (until 7/31). Utilization would be limited to 50% on grass, 60% on browse.	Livestock forage condition	7,017 acres good 13,008 acres fair 0 acres poor 0 unsuitable SHEEP 14,641 acres good 5,384 acres fair 0 acres poor 0 unsuitable	No change overall. Condition on fair acres would improve but remain fair.	Grazing systems may cause individual species in a plant community to increase or decrease in composition while maintaining the overall density of the plant community. The rate of range recovery from poor to excellent condition may take as long as 20 to 40 years with complete rest from livestock grazing (Appendix 16 narrative).
			Apparent trend	0 acres up 12,231 acres static 7,794 acres down 0 unsuitable	Acres in down trend may improve to static trend; acres in static trend may improve to upward trend.	
			Desirable plant vigor	Poor	Vigor on spring use pastures would decline; vigor on other pastures would improve. No change overall due to rotation of use.	
			Utilization of key species	54%	Would decrease to 50% on grass key species, 60% on browse key species.	
			Composition and density	44% density 25% grass 10% forbs 65% shrubs	No change Increase Decrease Decrease	
			Livestock forage production	2,702 AUMs cattle 414 AUMs sheep	May increase slightly.	NOTE: Due to the utilization above, there would be 200 AUMs cattle, and 31 AUMs sheep less use than in initial action or overuse would occur.
Big Creek 15,186 acres treated	Vegetation treatment	Vegetation manipulation on 15,186 acres by fire or chemical means followed by seeding of desirable species.	Livestock forage condition	CATTLE 7,017 acres good 13,008 acres fair 0 acres poor 0 unsuitable SHEEP 14,641 acres good 5,384 acres fair 0 acres poor 0 unsuitable	Condition on acres treated would go down for 3 years following treatment, then improve to either fair or good. Untreated acres not affected.	At least 2 full years of rest from grazing may be required to establish seedings; longer rest would be required if dry conditions prevail. Undesirable shrubs (rabbitbrush) may increase as much asas 9 times over present levels following vegetation treatment (Appendix 16 narrative).

(continued)

TABLE 4 (continued)

Allotment and Area Affected	Proposed Management Action	Change From Present Management	Resource Category	Resource Condition after Initial Action	Probable Impact	Reason for Impact
Big Creek (continued)			Apparent trend	0 acres up 12,231 acres static 7,794 acres down 0 unsuitable	Trend would go down on acres treated for 3 years following treatment, then improve to upward trend. Untreated acres not affected.	
			Desirable plant vigor	Poor	Vigor would go down on acres treated for 1 or 2 years following treatment, then improve to at least fair. Untreated acres not affected.	
			Utilization of key species	54%	Utilization would increase for 3 years following treatment, then decrease. See livestock production below.	
			Composition and density	44% density 25% grass 10% forbs 65% shrubs	Composition on 1,014 acres to be treated for deer winter range would be less than 50% grass, 10% forbs, and more than 40% shrubs. Composition on 14,172 acres to be treated for deer summer range would be less than 65% grass, 10% forbs, and more than 25% shrub. Untreated acres not affected.	NOTE: Some undesirable species, notably rabbitbrush, may significantly increase in composition on areas treated.
			Livestock forage production	2,702 AUMs cattle 414 AUMs sheep	Livestock forage production would decrease on acres treated for 3 years following treatment, would then recover to pretreatment levels and reach potential of 1,689 additional AUMs on treated acres 5 years after treatment.	NOTE: Loss of forage associated with treatment would necessitate livestock leaving range earlier than usual first 3 years following treatment for any pasture.

(continued)

TABLE 4 (continued)

Allotment and Area Affected	Proposed Management Action	Change From Present Management	Resource Category	Resource Condition after Initial Action	Probable Impact	Reason for Impact
Big Creek Allotment-wide (overall summary)	Long term management actions	Grazing system, land treatment	Livestock forage condition	See Above	15,186 acres would decline for 3 years following treatment. Acres would then improve to either fair or good condition. Balance of allotment would be unchanged.	See Above
			Apparent trend	See Above	Trend on treated acres would go down for 3 years following treatment. Trend would then be upward on these acres. Balance of allotment would show acres in down trend improve to at least static, static acres improve to upward trend.	
			Desirable plant vigor	See Above	Vigor would go down on treated acres for 1 or 2 years following treatment, then improve to at least fair. Balance of allotment would be unchanged.	
			Utilization of key species	See Above	Utilization would decline to 50% on grass, 60% on browse species.	
			Composition and density	See Above	Composition on 1,014 acres treated would be less than 50% grass, 10% forbs, and more than 40% shrub. Composition on 14,172 acres treated would be less than 65% grass, 10% forbs, and more than 25% shrub. The balance of allotment	

(continued)

TABLE 4 (concluded)

Allotment and Area Affected	Proposed Management Action	Change From Present Management	Resource Category	Resource Condition after Initial Action	Probable Impact	Reason for Impact
Big Creek (concluded)					would show a gradual increase in grass composition, and a gradual decline in forb and shrub composition. Some undesirable shrubs (rabbitbrush) may significantly increase in composition on treated acreage.	
			Livestock forage production	**See Above**	Forage production would decrease for 3 years following treatment on acres. Production would then be restored and increased within an additional 5 years after treatment. Balance of allotment would show a gradual increase in production.	NOTE: Due to the utilization restriction, it appears there would be 200 AUMs cattle, and 31 AUMs sheep less use than in initial action.

NOTE: Except where noted, acres within condition and trend categories did not shift to the next category. The probable impact indicates direction. It is likely that all acres in each category shift within a resource condition as indicated by impact.

APPENDIX 17

Summary of Impacts to Wildlife, Initial Action

Allotment	Resource Category and Area Affected	Existing Condition	Proposed Management Action and Change	Probable Impacts	Probable Condition	Specific Causes and Documentation of Impacts
Bear Lake	Critical deer winter range 1,050 acres	Good; excellent cover and species diversity; browse plentiful.	Season of use later turn-on	Continued good	Good condition critical deer winter range	No degradation of wildlife forage (Vegetation, Chapter 3)
			Stocking rate reduced	Continued good		
Big Creek	One sage grouse complex	Poor; overutilization, cover and preferred species absent.	Season of use shortened	Continued overuse of important meadow areas during summer.	Poor	Moderate adjustments of stocking rates do not reduce heavy livestock overuse of meadow and riparian areas (see Fisheries). These meadows are vital for sage grouse brood rearing. Young chicks depend totally upon new succulent forbs and associated insect populations for their food (Braun, Savage, BLM Manual 6601-3). Savage (1969) reported that young sage grouse diets consisted entirely of species restricted to meadow sites.
			Stocking rate reduced	Continued heavy concentration and overuse in important meadow areas.		
	Critical deer winter range 1,014 acres	Poor; overutilized, cover absent, preferred browse absent.	Forage allocation method	Major lack of quality forage resulting from forage allocation procedure.	Poor	Deer were allocated forage only after cattle and sheep allocations were filled. Further, deer received low quality forage (Chapter 1, Appendix 6, Wildlife Chapter 3).
			Season of use shortened	Minor improvement from reduced late fall competition between deer and sheep.		No significant improvement of forage composition is predicted by Vegetation, Chapter 3. Jenson et al., (1972) reported that livestock compete with deer for fall winter forage. Initial action season of use adjustments would reduce this competition significantly.
			Stocking rate reduced	Minor improvement from reduced stocking rate.		
	Riparian areas 6 miles	Poor; overutilization, cover and preferred species absent.	Season of use shortened	Continued overuse and decline of vigor.	Poor	Grazing riparian areas during summer is detrimental to riparian vegetation. Livestock would continue to concentrate and overuse riparian areas despite reductions in stocking rates. Riparian areas left unprotected from cattle grazing degrade to poor condition (Fisheries, Chapter 3).
			Stocking rate reduced	Continued overuse.		
			Range development-fencing 4.25 miles fenced.	Major improvement of wildlife habitat.	Good	Riparian areas fenced from livestock use will improve to site potential (Fisheries, Chapter 3).
				Unfenced habitat would continue to degrade.	Poor	

(continued)

APPENDIX 17 (continued)

Allotment	Resource Category and Area Affected	Existing Condition	Proposed Management Action and Change	Probable Impacts	Probable Condition	Specific Causes and Documentation of Impacts
Deseret	Four sage grouse complexes (two poor, two fair)	Poor; low forb and sagebrush densities.	Season of use shortened	Minor increase of forage available for sage grouse at brood hatching time.	Poor, stable	Young sage grouse chicks depend heavily on young forbs and insects for feed during first 8 weeks of life (Braun et al., BLM Manual 6601-3, Savage, 1969). Eliminating sheep grazing during late spring would increase forb supply for young grouse at hatching. Increased cattle numbers would increase concentrations in meadows increasing competition with young grouse at hatching. Increased cattle numbers would increase concentrations in meadows increasing competition with young grouse.
			Stocking rate/class of livestock; sheep decreased, cattle increased.	Intensified competition during summer between cattle and sage grouse chicks for forage.		
	Critical deer winter range 250 acres	Poor; excessive overutilization, preferred browse nearly absent.	Forage allocation method	Major lack of quality forage resulting from allocation procedure.		Deer were allocated forage only after cattle and sheep allocations were filled. Further, deer received low quality forage (Chapter 1, Appendix 6; Wildlife Chapter 3).
			Season of use shortened	Major reduction in deer/livestock competition for available winter forage.	Poor; no improvement of preferred browse composition and possible overutilization of preferred browse.	No significant improvement of forage composition is predicted by Vegetation, Chapter 3. Jenson et al., (1972) reported that livestock compete with deer for fall and winter forage. Initial action season of use adjustments would reduce this competition significantly.
				Stocking rates of cattle increased, sheep decreased	No significant change	
Dry Basin	One sage grouse complex	Fair; low forb densities.	Season of use-later turnout	Minor increase of available forage at chick hatching.	Fair	Moderate adjustments of stocking rates do not reduce heavy livestock overuse of meadow and riparian areas (see Fisheries). These meadows are vital for sage grouse brood rearing. Young chicks depend totally upon new succulent forbs and associated insect populations for their food (Braun, Savage, BLM Manual (6601-3). Savage (1969) reported that young sage grouse diets consisted entirely of species restricted to meadow sites.
			Stocking rate-no change	Cattle would concentrate in meadow areas important to hens and chicks.		
Duck Creek	Four sage grouse complexes	Fair; low forb densities	Season of use lengthened	Continued heavy use of meadow areas which provide important forage to chicks and hens.	Fair	Moderate adjustments of stocking rates do not reduce heavy livestock overuse of meadow riparian areas (see Fisheries). These meadows are vital for sage grouse brood rearing. Young chicks depend totally upon new succulent forbs and associated insect lations for their food (Braun, Savage, BLM Manual 6601-3). Savage (1969) reported that young sage grouse diets consisted entirely of species restricted to meadow sites.

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APPENDIX 17 (continued)

Allotment	Resource Category and Area Affected	Existing Condition	Proposed Management Action and Change	Probable Impacts	Probable Condition	Specific Causes and Documentation of Impacts
Duck Creek (concluded)			Stocking rate reduced	Same as above.		
	Riparian 3.25 miles	Poor; cover and preferred species absent.	Season of use lengthened; stocking rate-minor decrease cattle.	Livestock would continue to concentrate and overgraze riparian areas.	Poor, continued decline	Grazing riparian areas during summer is detrimental to riparian vegetation. Livestock would continue to concentrate and over use riparian areas despite reductions in stocking rates. Riparian areas left unprotected from cattle grazing degrade to poor condition (Fisheries, Chapter 3).
Eastman	Critical deer winter range 550 acres	Poor, excessive utilization; preferred species nearly absent.	Forage allocation method	Major lack of quality forage resulting from allocation process.	Poor, no increase in composition and possible overutilization of preferred browse.	Deer were allocated forage only after cattle and sheep allocations were filled. Further, deer received low quality forage (Chapter 1, Appendix 6, Wildlife Chapter 3).
			Season of use later turn-on	Overutilization of forage may decrease as stocking rates are adjusted to range survey levels.		Deer and sheep use the same browse and the competition intensifies as succulent plants are out in late summer (Jenson et al.). Sheep grazing during the late summer and fall would remove forage that would be used by deer during the winter.
			Stocking rate of cattle decreased sheep increased			
			Class of livestock - sheep introduced.	Moderate increased use of deer fall/ winter browse by sheep.		
East Woodruff	Two sage grouse complexes	Poor; overutilization, low forb and sagebrush densities.	Season of use - no change	Continued competition between livestock and young sage grouse in meadow areas.	Poor	Moderate adjustments of stocking rates do not reduce heavy livestock overuse of meadow and riparian areas (see Fisheries). These meadows are vital for sage grouse brood rearing. Young chicks depend totally upon new succulent forbs and associated insect populations for their food (Braun, Savage, BLM Manual 6601-3). Savage (1969) reported that young sage grouse diets consisted entirely of species restricted to meadow sites.
			Stocking rate-small increase	No significant increase in competition levels.		
Kearl						

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APPENDIX 17 (continued)

Allotment	Resource Category and Area Affected	Existing Condition	Proposed Management Action and Change	Probable Impacts	Probable Condition	Specific Causes and Documentation of Impacts
Laketown	Critical deer winter range 894 acres	Good; excellent cover and forage condition, plentiful browse.	Forage allocation method	Lack of quality forage resulting from allocation process.	Good	Deer were allocated forage only after cattle and sheep allocations were filled. Further, deer received low quality forage (Chapter 1, Appendix 6; Wildlife, Chapter 3).
			Season of use shortened in spring	Continued fall grazing by cattle would remove deer winter forage.		
			Stocking rate - no change	No effect		
	Riparian areas 4.0 miles	Poor; cover and preferred species absent.	Season of use shortened in spring	Livestock grazing in riparian areas during spring and summer degrades riparian habitat.	Poor	Grazing riparian areas during summer is detrimental to riparian vegetation. Livestock would continue to concentrate and overuse riparian areas despite reductions in stocking rates. Riparian areas left unprotected from cattle grazing degrade to poor condition (Fisheries, Chapter 3).
			Stocking rate - no change	Adjustments not considered to be significant. Livestock will continue to concentrate and overuse riparian areas.		
			Range developments-fencing 2.25 stream miles	Fenced areas would improve from poor to good condition.	Good	Duff (1977) and Fisheries Chapter 3 state that riparian areas fenced from livestock use would improve to site potential. Further, riparian areas left unprotected from livestock use would decline to poor condition.
			3.75 stream miles	Unprotected areas would remain in or degrade to poor condition.	Poor	
Meachum Canyon	Critical deer winter range 243 acres	Poor; past history of excessive overuse, no cover. Preferred species nearly absent. Condition is improving.	Forage allocation method	Major lack of quality forage resulting from allocation method.	Poor. Proposed action would negate past improvements.	Deer were allocated forage only after cattle and sheep allocations were filled. Further, deer received low quality forage (Chapter 1, Appendix 6; Wildlife Chapter 3).
			Stocking rate-major sheep increases	Increases would probably negate improvements from season of use.		Deer and sheep use the same browse and the competition intensifies as succulent plants dry out in late summer (Jenson et al.). Sheep grazing during the late summer and fall would remove forage that would be used by deer during the winter.

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APPENDIX 17 (continued)

Allotment	Resource Category and Area Affected	Existing Condition	Proposed Management Action and Change	Probable Impacts	Probable Condition	Specific Causes and Documentation of Impacts
Meachum Canyon (concluded)	Riparian areas 2 miles	Fair; some cover and preferred species present.	Season of use-early summer, early winter.	Livestock grazing in riparian areas during spring and summer would degrade habitat quality.	Fair, would probably degrade to poor.	Duff (1977) and Hormay (1976) found that riparian areas unprotected from livestock grazing would decline to poor condition.
			Stocking rate-major sheep increases	Only moderate increase in use would be expected as sheep would not concentrate in riparian areas as intensely as cattle.		
Middle Ridge	Riparian areas 1.75 miles	Fair; 0.75 mile Poor; 1.0 mile	Season of use-early summer through early winter.	Livestock grazing in riparian areas during spring and summer would degrade habitat quality.	Fair, would probably degrade to poor.	Duff (1977) and Hormay (1976) found riparian areas unprotected from cattle grazing would decline to poor condition.
			Stocking rate-major sheep increases	Only moderate increase in use would be expected as sheep would not concentrate in riparian areas as intensely as cattle.		
New Canyon	**One sage grouse complex**	**Poor; overutilization, low forb and grass densities.**	Season of use-continuous grazing of sheep	Sheep would be allowed to graze through summer competing with young chicks for forage. Cattle would continue to concentrate in important meadow areas during summer months competing with grouse chicks.	**Poor, lower quality of habitat.**	**Moderate adjustments of stocking rates do not reduce heavy livestock overuse of meadow and riparian areas** (see Fisheries). These meadows are vital for sage grouse brood rearing. Young chicks depend totally upon new succulent forbs and associated insect populations for their food (Braun, Savage, BLM Manual (6601-3). Savage (1969) reported that young sage grouse diets consisted entirely of species restricted to meadow sites.
			Stocking rate-minor cattle reduction	Reduction very minor and would not reduce concentration levels in meadow areas.		

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APPENDIX 17 (continued)

Allotment	Resource Category and Area Affected	Existing Condition	Proposed Management Action and Change	Probable Impacts	Probable Condition	Specific Causes and Documentation of Impacts
New Canyon (concluded)	Riparian areas 7 miles	Fair; some cover and preferred species absent.	Season of use lengthened	Livestock grazing in riparian areas during spring and summer would degrade habitat quality.	Fair, would degrade to poor.	Grazing riparian areas during summer is detrimental to riparian vegetation. Livestock would continue to concentrate and overuse riparian areas despite reductions in stocking rates. Riparian areas left unprotected from cattle grazing degrade to poor condition (Fisheries, Chapter 3).
	5 miles	Poor, cover and preferred species absent.	Stocking rate-minor increase	Increases would add minor amounts of pressure to existing levels. Cattle would continue to concentrate in riparian areas and overuse would continue.	Poor, would degrade further.	
			Range development-fencing 5.75 miles	Protected areas would improve to good.	Good, up from poor.	Duff (1977) and Fisheries Chapter 3 state that riparian areas protected from cattle grazing would improve to good condition.
Rabbit Creek	Riparian areas 0.25 mile	Poor; overgrazed, cover and preferred species absent.	Season of use shortened in spring	Livestock grazing in riparian areas during spring and summer would degrade habitat quality.	Poor	Grazing riparian areas during summer is detrimental to riparian vegetation. Livestock would continue to concentrate and over use riparian areas despite reductions in stocking rates. Riparian areas left unprotected from cattle grazing degrade to poor condition (Fisheries, Chapter 3).
			Stocking rate - no change	Overuse would continue as cattle would continue to concentrate at maximum levels in riparian areas.		
Sage Creek	Three sage grouse complexes	Fair; low forb and grass densities.	Season of use - continuous grazing of sheep	Sheep would be allowed to graze through the summer competing with young grouse for succulent forbs. Cattle would continue to concentrate in important meadow areas during the summer competing with grouse chicks.	Fair, would decline.	Moderate adjustments of stocking rates do not reduce heavy livestock overuse of meadow and riparian areas (see Fisheries). These meadows are vital for sage grouse brood rearing. Young chicks depend totally upon new succulent forbs and associated insect populations for their food (Braun, Savage, BLM Manual 6601-3). Savage (1969) reported that young sage grouse diets consisted entirely of species restricted to meadow sites.
			Stocking rate - no change	Overuse would continue as livestock concentrations would remain the same.		

(continued)

APPENDIX 17 (continued)

Allotment	Resource Category and Area Affected	Existing Condition	Proposed Management Action and Change	Probable Impacts	Probable Condition	Specific Causes and Documentation of Impacts
Sage Creek (concluded)	Riparian areas 3.25 miles	Poor; overgrazed, preferred species and cover absent.	Season of use - continuous grazing of sheep	Moderate increase of use from sheep as sheep do not concentrate as heavily in riparian areas as cattle.	Poor, would decline.	Grazing riparian areas during summer is detrimental to riparian vegetation. Livestock would continue to concentrate and over use riparian areas despite reductions in stocking rates. Riparian areas left unprotected from cattle grazing degrade to poor condition (Fisheries, Chapter 3).
			Stocking rate - no change	Cattle will continue to concentrate heavily in riparian areas. Overgrazing would continue.		
Session						
South Woodruff	Three sage grouse complexes	Fair; low cover and forage densities.	Season of use shortened in spring and fall.	Moderate reduction in forage removed before clutches hatch.	Fair, stable	Moderate adjustments of stocking rates do not reduce heavy livestock overuse of meadow and riparian areas (see Fisheries). These meadows are vital for sage grouse brood rearing. Young chicks depend totally upon new succulent forbs and associated insect populations for their food (Braun, Savage, BLM Manual (6601-3). Savage (1969) reported that young sage grouse diets consisted entirely of species restricted to meadow sites.
			Stocking rate-cattle reduced	Cattle will continue to concentrate in meadows important to young sage grouse. Reductions would not lower the concentrations.		
	Critical deer winter range 2,366 acres	Very poor; excessively overused, preferred species nearly absent.	Forage allocation method	Major lack of quality deer forage as result of forage allocation procedure.	Poor	Deer were allocated forage only after cattle and sheep allocations were filled. Further, deer received low quality forage (Chapter 1, Appendix 6; Wildlife, Chapter 3).
			Season of use shortened	Major reduction in deer/sheep competition for winter forage.		No significant improvement of forage composition is predicted by Vegetation, Chapter 3. Jenson, et al., (1972) reported that livestock compete with deer for fall and winter forage. Initial action season of use adjustments would reduce this competition significantly.
			Stocking rate - cattle reduced	Minor reduction in cattle/deer competition for winter forage.		

(continued)

APPENDIX 17 (continued)

Allotment	Resource Category and Area Affected	Existing Condition	Proposed Management Action and Change	Probable Impacts	Probable Condition	Specific Causes and Documentation of Impacts
South Woodruff (concluded)	Riparian	Poor; overgrazed, cover and preferred species absent.	Season of use shortened	Livestock grazing in riparian areas during spring and summer.		Grazing riparian areas during summer is detrimental to riparian vegetation. Livestock would continue to concentrate and overuse riparian areas despite reductions in stocking rates. Riparian areas left unprotected from cattle grazing degrade to poor condition (Fisheries, Chapter 3).
			Stocking rate-cattle reduced	Overuse would continue as livestock concentrations would remain the same.		
Stuart	Critical deer winter range 930 acres	Poor; excessive overutilization, preferred species and cover absent.	Forage allocation method short season	Moderate lack of quality forage resulting from allocation procedure.	Poor, and would not improve.	Deer were allocated forage only after cattle and sheep allocations were filled. Further, deer received only low quality forage (Chapter 1, Appendix 6, Wildlife, Chapter 3).
			Season of use - no change - short season	Would eliminate any livestock/deer competition for winter forage.		Proposed action would eliminate direct sheep/deer competition for winter forage.
			Stocking rate - major reduction	Would allow forage vigor to increase and possibly forage quantity.		
Twin Peaks	Riparian areas 1.5 miles	Poor, overgrazed, cover and preferred species absent.	Season of use no change	Same as Rabbit Creek.		Fisheries Chapter 3 and Duff (1977) report that poor condition riparian areas that are protected from cattle grazing improve to good condition.
			Stocking rate increased	Sheep do not concentrate in riparian areas as heavily as cattle; moderate increase in stocking rate will not increase current pressures greatly.		
	1.5 miles		Range improvements-fencing	All areas fenced for protection from livestock use would improve from poor to good.	Good, improving.	
Woodruff Pastures	Critical deer winter range 9,917 acres	Very poor; overutilization, cover and preferred species nearly absent.	Forage allocation method	Major lack of quality forage resulting from allocation procedure.	Very poor, stable	Deer were allocated forage only after cattle and sheep allocations were filled. Further, deer received only low quality forage (Chapter 1, Appendix 6, Wildlife, Chapter 3).

(continued)

APPENDIX 17 (concluded)

Allotment	Resource Category and Area Affected	Existing Condition	Proposed Management Action and Change	Probable Impacts	Probable Condition	Specific Causes and Documentation of Impacts
Woodruff Pastures (concluded)			Season of use-allowable use	Would continue present levels of competition between deer and cattle for winter forage.		Jensen et al., found substantial competition between deer and livestock for browse during summer, fall, and winter seasons.
			Grazing intensity	Same as above.		
	Riparian areas 0.75 mile	Poor to fair; overgrazed. Preferred species and cover nearly absent.	Season of use - early summer through early winter.	Livestock grazing in riparian areas during spring and summer would degrade habitat quality.	Poor, continued decline.	Duff (1977) and Hormay (1976) found that riparian areas unprotected from cattle grazing would decline to poor condition.

APPENDIX 18

Summary of Impacts to Wildlife, Long Term

Allotment	Resource Category and Area Affected	Probable Resource Condition After Initial Actions	Proposed Management Action and Change	Probable Impacts	Projected Long Term Habitat Condition	Specific Causes and Documentation
DEFERRED-ROTATION MANAGEMENT SYSTEMS						
Bear Lake	Critical deer winter range 1,050 acres	Good; no change	Grazing	Minor decrease in deer forage.	Good	Vegetation analysis predicts a decrease in forb and shrub composition (Vegetation, Chapter 3).
	Treatments on 675 acres		Land treatment (burning or spraying)	Minor improvement in forage quality.		Increased composition of preferred browse and controlled utilization of browse (Vegetation, Chapter 3).
	Fencing 2 miles		Range development fences	Minor hindrance of deer movements between summer and winter ranges.		Design restrictions would overcome hazard.
Big Creek	One sage grouse complex	Poor; overutilization, cover and forage absent. No significant improvement.	Grazing	Minor positive impact by eliminating sage grouse/livestock forage and spatial competition 2 out of 6 years during important summer months. No change 4 out of 6 years.	Poor	Decreased species composition of preferred sage grouse forage with management (Savage 1969, BLM Tech. Suppl. 6601-6, 1974, Vegetation Chapter 3).
			Land treatment	Major destruction of nesting, brood rearing, and wintering sites.		Land treatments would remove sagebrush. Sage grouse would abandon habitat treated for sagebrush removal (Walstad, 1975; Enyeart, 1956).
	Critical deer winter range 1,014 acres	Poor; overutilization. Preferred species absent. No significant improvement.	Grazing	Major forage shortage resulting from livestock consumption of allowable use on preferred browse during 2 consecutive years out of 6-year cycle.	Poor	Initiating grazing systems allows for proper use and rest on preferred browse species for 4 out of 6 years. Livestock grazing would occur in the fall months 2 years out of 6, resulting in maximum use on browse which may result in negative impact to wintering mule deer.
			Forage allocation method	Major lack of quality forage from allocation method.		Deer were allocated forage only after cattle and sheep allocations were filled. Further, deer received low quality forage (Chapter 1, Appendix 6; Wildlife, Chapter 3).
			Land treatment	Moderate short-term shortages of forage and cover. Minor improvement of forage quality.		Successful land treatments would increase quantities of preferred browse. Land treatments remove existing forage and cover. Localized forage shortages would occur.
			Range developments	Fences pose moderate hindrance of deer migration.		Fences pose serious barrier to migrating deer, especially those in poor or weakened physical condition (Calef, 1960).

(continued)

APPENDIX 18 (continued)

Allotment	Resource Category and Area Affected	Probable Resource Condition After Initial Actions	Proposed Management Action and Change	Probable Impacts	Projected Long Term Habitat Condition	Specific Causes and Documentation
DEFERRED-ROTATION MANAGEMENT SYSTEMS (continued)						
Big Creek (concluded)	Riparian areas 4.25 miles fenced	Good; up from poor condition.	Grazing	Continued overutilization for unfenced areas. Fenced areas improve from good to excellent.	Excellent	Fisheries Chapter 3.
	Unfenced 1.75 miles	No improvement; continued heavy use.			Poor	
Dry Basin	One sage grouse complex	Fair condition; continued low forb densities not significantly improved.	Grazing	Minor positive impact from elimination of sage grouse/livestock forage and spatial competition 2 out of 6 years during important summer months. No change 4 out of 6 years.	Fair	Limiting sheep use during four of six springs would significantly reduce negative impacts on breeding sage grouse (Jensen et al. 1972). Spring use 2 of 6 years may result in negative interaction between grouse and livestock.
			Land treatment	Major destruction of nesting, brood rearing, and wintering sites.		Land treatments would remove sagebrush. Sage grouse would abandon habitat treated for sagebrus removal (Walstad, 1975; Enyeart, 1956). Treatments would decrease forage available to sage grouse (Vegetation Chapter 3).
Duck Creek	Four sage grouse complexes	Fair; low forb density, not significantly improved.	Grazing Land treatment	Minor positive impact from elimination of sage grouse/livestock forage and spatial competition 2 out of 6 years during important summer months. No change 4 out of 6 years.	Fair	Limiting sheep use during four of six springs would significantly reduce negative impacts on breeding sage grouse (Jensen et al., 1972). Spring use 2 out of 6 years may result in negative interaction between grouse and livestock.
	Riparian 3 miles	Poor; preferred species absent, low cover.	Grazing	Continued overutilization.	Poor	Use of unprotected riparian zones by livestock (particularly cattle) is anticipated to be intense regardless of rest rotation. No improvement in condition is expected (Skoulin 1978; Duff 1977, Fisheries Chapter 3).
East Woodruff	Two sage grouse complexes	Continued poor; overutilization. Low forb and sagebrush densities.	Grazing	Minor positive impact from elimination of sage grouse/livestock competition for forage and space during 2 out of 6 years. Competition levels would remain the same 4 out of 6 years.	Poor	Limiting livestock use during spring and summer 2 of 6 grazing years would significantly improve sage grouse habitat by providing additional food and cover.
			Land treatments	Major destruction of nesting, brood rearing, and wintering sites.		Vegetation compositional shift would decrease forage and cover for sage grouse (BLM Manual Tech Suppl. 6601-3, Vegetation Chapter 3). Sage grouse abandon habitats treated for sagebrush removal (Walstad, 1975; Enyeart, 1956).

(continued)

Allotment	Resource Category and Area Affected	Probable Resource Condition After Initial Actions	Proposed Management Action and Change	Probable Impacts	Projected Long Term Habitat Condition	Specific Causes and Documentation
DEFERRED-ROTATION MANAGEMENT SYSTEMS (continued)						
Kearl	This allotment contains no critical deer winter range, sage grouse areas or riparian zones.					
Laketown	Critical deer winter range 894 acres	Good; excellent cover, preferred species plentiful.	Grazing	Continued good condition.	Good	Rest, especially spring/summer would provide increased herbaceous and browse production.
			Range developments	Fences may hinder migration.		Additional fences may hinder animal movement, especially during high stress periods (Calef, 1960). Water developments may increase livestock utilization resulting in increased competition for preferred forage.
			Forage allocation method	Moderate lack of quality forage resulting from forage allocation procedure.		Deer were allocated forage only after cattle and sheep allocations were filled. Further, deer received low quality forage (Chapter 1, Appendix 6; Wildlife, Chapter 3).
	Riparian fenced 2.25, unfenced 3.75 miles	Good; up from poor. No change; continued heavy use.	Grazing	Fenced riparian improve to excellent. Unfenced will continue in poor condition.	Excellent	Fenced riparian zones would continue to improve to excellent condition while unfenced portions would remain in poor condition (Skoulin, 1978; Duff, 1977, Wydowski, 1971; Fisheries Chapter 3).
Meachum Canyon	Critical deer winter range 243 acres	Poor; moderate recovery from past excessive use then stabilize in poor condition.	Grazing	Major negative impact. System permits removal of allowable use on browse by 12/31 on critical deer winter range	Poor	Livestock grazing during fall and early winter (12/31) would directly compete with mule deer for available forage which may result in herd reductions (Dasmann, 1971). The remaining four grazing seasons would enhance browse production and may benefit mule deer.
			Land treatment	Moderate improvement of deer browse quality and quantity to fair condition.		Land treatments may enhance forage quality and quantity; however, forage would decline as seeding matures. Additional water may result in better utilization by livestock leading to increased competition.
Forage allocation method	Moderate lack of quality forage resulting from allocation process.			Deer were allocated forage only after cattle and sheep allocations were filled. Further, deer received low quality forage (Chapter 1, Appendix 6; Wildlife, Chapter 3).		
	Riparian 2 miles	Low fair to poor; cover and preferred species nearly absent.	Grazing	Continued overuse and downward trend.	Poor	Grazing systems would have no effect upon restoring riparian areas. Rest periods are not sufficient (Fisheries Chapter 3).

(continued)

Allotment	Resource Category and Area Affected	Probable Resource Condition After Initial Actions	Proposed Management Action and Change	Probable Impacts	Projected Long Term Habitat Condition	Specific Causes and Documentation
DEFERRED-ROTATION MANAGEMENT SYSTEMS (continued)						
New Canyon	One sage grouse complex	Poor to fair; overutilization, low forb/grass	Grazing	Minor positive impact from elimination of sage grouse/livestock competition for forage and space during 2 out of 6 years. Competition levels remain the same 4 out of 6 years.	Poor	Decreased production of shrubs and forbs would reduce food and cover to sage grouse. Livestock grazing competition would be reduced during spring period 4 out of 6 years.
			Land treatments	Land treatments would destroy sage grouse nesting, brood rearing, and wintering sites.		Additional water developments would increase livestock distribution which may increase competition for forbs with sage grouse. Sage grouse abandon habitat treated for sagebrush removal (Walstad, 1975; Enyeart, 1956).
	Riparian fenced 5.75, unfenced 6.25 miles	Good; up from poor or fair condition. Poor; continued overuse.	Grazing	Fenced areas improve to excellent. Unfenced areas remain in poor condition.	Excellent Poor	Fenced sections may improve to excellent condition (Duff, 1977; Fisheries Chapter 3). No anticipated improvement of unfenced riparian zones.
Rabbit Creek	Riparian habitats 0.25 mile	Poor; continued overuse.	Grazing system	Continued overuse.	Poor	Rotational grazing systems would prove ineffective in restoring riparian habitats (Fisheries Chapter 3). Riparian areas left unprotected from cattle grazing would decline to poor condition (Duff, 1977).
Sage Creek	Three sage grouse complexes	Fair condition; no significant improvement of forb production or meadow condition.	Grazing	Moderate negative impact on herbaceous plant production. Reduced competition between livestock and sage grouse in 4 out of 6 years.	Fair	Vegetation predicts an overall decrease of sage grouse forage and cover species.
			Land treatments	Land treatments would destroy sage grouse nesting, brood rearing, and wintering sites.		Sage grouse abandon habitat treated for sagebrush removal (Walstad, 1975; Enyeart, 1956).
	Riparian 3.25 miles	Continued degradation of riparian habitat and associated meadow areas.		Continued overuse of 3.25 miles of riparian habitat along Sage Creek and North Fork Sage Creek.	Poor	Unfenced riparian zones and associated meadows would continue to receive heavy livestock use. No significant improvement is anticipated (Fisheries Chapter 3, Duff, 1977).
Stuart	Critical deer winter range 930 acres	Poor condition for deer due to lack of habitat diversity.	Grazing	Minor forage increase.	Poor	Periodic rest combined with treatment of 750 acres would increase forage quality for mule deer; however, forage would decline as the treatment matures. The addition of water would increase livestock utilization throughout the allotment which may result in increased deer/livestock competition.

(continued)

APPENDIX 18 (continued)

Allotment	Resource Category and Area Affected	Probable Resource Condition After Initial Actions	Proposed Management Action and Change	Probable Impacts	Projected Long Term Habitat Condition	Specific Causes and Documentation
DEFERRED-ROTATION MANAGEMENT SYSTEMS (concluded)						
Stuart (concluded)			Forage allocation method	Moderate lack of quality forage resulting from allocation method.		Deer were allocated forage only after cattle and sheep allocations were filled. Further, deer received low quality forage (Chapter 1, Appendix 6; Wildlife, Chapter 3).
Twin Peaks	Riparian 1.5 miles	Good condition with upward trend on fenced stream portions.	Range development fencing	Riparian areas protected from livestock grazing improve to site potential.	Excellent	Fencing all available riparian habitat (1.25 miles) would continue to improve habitat condition eventually resulting in excellent condition habitat (Fisheries Chapter 3, Duff, 1977, Platts, 1977).
Woodruff Pastures	Critical deer winter range 7,292 acres	Very poor; no improvement in browse composition or cover.	Grazing allowable use fall and winter grazing.	Further decline of preferred browse with possible elimination. Severe forage and spatial competition on very poor critical deer winter range.	Very poor	Vegetation Chapter 3 shows further decline of browse and forbs species, thus reducing available deer forage on very poor condition range. Management allows removal of allowable browse before critical winter period for deer. Season of use permits direct livestock/deer spatial and forage competition.
			Forage allocation method	Severe lack of quality forage resulting from allocation method.		Deer were allocated forage only after cattle and sheep allocations were filled. Further, deer received low quality forage (Chapter 1, Appendix 6; Wildlife, Chapter 3).
			Land treatments spraying and burning	Treatments would eliminate winter forage and cover for deer.	Very poor	Range treatments would remove browse and cover for deer on critical deer winter range. Additional forage values from treatments would decrease as the seeding matures.
	Riparian 0.75 mile	Poor; down from fair.	Grazing	Continued downward trend and overuse.	Poor	Duff (1977) and Skoulin (1978) reported that riparian habitat condition would continue to decline despite grazing management systems.
CONTINUED INITIAL ACTION MANAGEMENT						
Eastman	Critical deer winter range 550 acres	Poor; preferred species nearly absent. Up from very poor.	Continue initial action management.	No predictable changes.	Poor	Limited amount of deer forage combined with poor livestock forage may result in continued overuse of browse despite livestock reductions. Anticipated continued overuse of preferred browse species as undesirable grass species cure around July 10.
			Forage allocation method	Major lack of quality forage resulting from allocation method.		Deer were allocated forage only after cattle and sheep allocations were filled. Further, deer received low quality forage (Chapter 1, Appendix 6; Wildlife, Chapter 3).

(continued)

APPENDIX 18 (concluded)

Allotment	Resource Category and Area Affected	Probable Resource Condition After Initial Actions	Proposed Management Action and Change	Probable Impacts	Projected Long Term Habitat Condition	Specific Causes and Documentation
CONTINUED INITIAL ACTION MANAGEMENT (continued)						
Deseret	Four sage grouse complexes	Poor; low forb and brush densities. No significant change.	Continued initial action management.	Minor improvement in forb component of sage grouse habitat. No significant improvement in cover. cover. Continued livestock concentration in meadow areas.	Poor	A slight improvement in herbaceous production is not anticipated to significantly enhance sage grouse production.
	Critical deer winter range 250 acres	Very poor; excessive overutilization	Continued initial action management	Moderate reduction of forage and spatial competition between deer and livestock.	Poor	Due to limited amounts of preferred browse and grass, continued excessive use of key browse is expected during second half of grazing season. Although less than existing situation, the livestock reductions may result in only minor benefits to deer in regard to forage competition, but would result in reduced spatial competition.
			Forage allocation method	Major lack of quality forage resulting from allocation method.		Deer were allocated forage only after cattle and sheep allocations were filled. Further, deer received low quality forage (Chapter 1, Appendix 6; Wildlife, Chapter 3).
South Woodruff	Three sage grouse complexes	Fair; low forb and cover	Continued initial action management	Livestock would continue to concentrate in meadow and riparian areas important for sage grouse brood rearing. Continued overall fair condition.	Poor	Heavy livestock use of riparian and meadow vegetation would negatively impact sage grouse breeding and brood rearing complexes (Savage, 1969).
	Critical deer winter range 1,952 acres	Poor; low preferred species composition.	Continued initial action management	Critical deer winter range should improve from very poor to poor, then static.	Poor	Improved vigor and production on existing vegetation as well as reduced livestock use may provide additional quality and quantity of forage. Due to poor ecological condition of this site, the improvement may be limited.
			Forage allocation method	Major quality and quantity forage shortage from allocation method.		Deer were allocated forage only after cattle and sheep allocations were filled. Furtner, deer received low quality forage (Chapter 1, Appendix 6; Wildlife, Chapter 3).
	Riparian 2 miles	Poor; overgrazed. Preferred species absent.	Continued initial action management	Continued poor condition.	Poor	Fisheries Chapter 3, Duff, 1977.
DISPOSAL						
Middle Ridge	Riparian 1.75 miles	Poor	Disposal	Loss of 1.75 miles of riparian habitat in downward trend.	Poor	Disposal of 1.75 miles riparian habitat and 1,286 acres removes BLM-administrative responsibility, thus losing any potential for habitat improvement programs that might be initiated.
	Seasonal deer habitat	Fair 1,286 acres	Disposal	Loss of 251 AUMs deer forage.		
Session	Seasonal deer habitat	Fair 238 acres	Disposal	Loss of 238 acres (40 AUMs) of wildlife habitat.		Loss of administrative control would result in the loss of any management of wildlife resources covering 238 acres. Species involved are mule deer, variety of mammals, and birds.

APPENDIX 19

Impacts to Fisheries Habitat by Key Resource Parameters

Allotment	Stream	Proposed Action Change	Fisheries Values Potential	Present Habitat Condition	Potential Habitat Condition	Riparian Vegetation Removal	Physical Damage Trampling	Streambed Silts	Water Quality Temp-erature/ Nutrients	Pool Quality	Predicted Fisheries Value and Use
Woodruff Pastures	Birch Creek	Initial. No change in intensity. Season long grazing RR through early winter except Laketown to early fall and North Fork Six-mile to fall. Protective fencing in Laketown.	High	Fair, poor	Fair to poor, declining	Decline	Decline	No change	No change	No change	No change CWT
Rabbit Creek	North Fork Six-mile		Medium	Poor	Poor, declining	Decline	Decline	Decline	Decline	Decline	Decline CWT ↓ NG →
Sage Creek	North Fork Sage Creek		Medium	Poor	Poor, declining	Decline	Decline	Decline	Decline	Decline	Decline CWT ↓ NG →
	Sage Creek		Medium	Fair, poor	Fair to poor, declining	Decline	Decline	Decline	Decline	Decline	Decline CWT ↓ NG →
Laketown	Laketown Creek		High	Fair, poor	Good 25% upward Poor 75% declining	Improve Decline	Improve Decline	Decline Decline	Decline Decline	Decline Decline	Improve CWS ± No change CWS ↓
* * * * * * * * * *											
Meachum Canyon	Home Creek	Increase intensity; protective fencing in Laketown. RR late spring to early fall/early winter.	Low	Poor	Poor, declining	Decline	Decline	Decline	Decline	Decline	No change CWT ↓ NG →
Twin Peaks	Laketown Creek		High	Fair, poor	Good 83% upward Poor 17% declining	Improve Decline	Improve Decline	Decline Decline	Decline Decline	Decline Decline	Improve CWS ± Decline CWS ↓
Middle Ridge	Walton Creek		Medium	Fair, poor	Fair to poor, declining	Decline	Decline	No change	No change	No change	No change CWT ↓
	Woodruff Creek		High	Fair	Fair, No change	Decline	Decline	No change	No change	No change	No change CWT
* * * * * * * * * *											
Duck Creek	South Fork Six-mile Creek	Decrease intensity. Protective fencing on Randolph, North Fork Otter, Middle Fork Otter, Spring, and Little Creeks.	Medium	Poor	Poor, declining	Decline	Decline	Decline	Decline	Decline	Decline CWT ↓ NG →
	North Fork Sage Creek		Medium	Poor	Poor, declining	Decline	Decline	Decline	Decline	Decline	Decline CWT ↓ NG →
Big Creek	Big Creek (exclosure)	RR to early fall/early winter	High	Good	Excellent, upward	Improve	Improve	No change	No change	No change	No change CWT
	Big Creek (outside exclosure)		High	Poor	Poor, declining	Decline	Decline	Decline	Decline	Decline	Decline CWT ↓ NG →
	Randolph		High	Fair, poor	Good 58%, upward Poor 42%, declining	Improve Decline	Improve Decline	No change Decline	No change Decline	No change Decline	Improve CWT ± Decline CWT ↓ NG →

(continued)

APPENDIX 19 (concluded)

Allotment	Stream	Proposed Action Change	Fisheries Values Potential	Present Habitat Condition	Potential Habitat Condition	Riparian Vegetation Removal	Physical Damage Trampling	Streambed Silts	Water Quality Temp-erature/ Nutrients	Pool Quality	Predicted Fisheries Value and Use
New Canyon	North Fork Otter Creek		High	Fair, poor	Good 45%, upward Poor 55%, declining	Positive Negative	Positive Negative	Positive Negative	Positive Negative	Positive Negative	Positive CWS ↑ Negative CWT ↓ NG →
	Middle Fork Otter Creek		High	Poor	Good 43%, upward Poor 57%, declining	Positive Negative	Positive Negative	Positive Negative	Positive Negative	Positive Negative	Positive CWS ↑ Negative CWT ↓ NG →
	South Fork Otter Creek		High	Poor	Poor, declining	Negative	Negative	Negative	Negative	Negative	Negative CWT ↓ NG →
	New Canyon Creek		Low	Poor	Poor, declining	Negative	Negative	Negative	Negative	Negative	Negative CWT ↓ NG →
	Spring Creek		High	Poor	Good 50%, upward Poor 50% declining	Positive Negative	Positive Negative	No change Negative	No change Negative	No change Negative	No change CWS Negative CWS ↓
	Little Creek		High	Poor	Good 60%, upward Poor 40%, declining	Positive Negative	Positive Negative	No change Negative	No change Negative	No change Negative	No change CWS Negative CWS ↓
	Old Canyon Creek		Low	Fair, poor	Fair to poor, declining	Negative	Negative	Negative	Negative	Negative	Negative CWT ↓ NG →
South Woodruff	Home Creek (same as in Meachum Canyon).		Low	Poor	Poor, declining	Negative	Negative	Negative	Negative	Negative	No change CWT NG →
		Long term all similar to Initial except Middle Ridge eliminated.									

Legend: CWT = cold water trout   CWS = cold water sensitive species (Utah cutthroat)   NG = Trend would be toward warm water nongame species.

↓ = downward condition and trend   ↑ = upward condition and trend

CWS ↓ means that water designated to be transplanted with Utah cutthroat in future, but grazing continuation above protected area would negate benefits and may make it infeasible to conduct transplant.

CWT ↓ NG → = the present cold water trout fishery would be expected to decline and habitat would tend toward warm water, nongame species.

Good 25%, upward / Poor 75%, declining = Two different anticipated impacts for the same item. Good condition and upward trend is 25%. Poor condition and downward trend is 75%.

RR = Range Readiness

APPENDIX 20

Determination of Initial Allocations
to Wildlife and Livetock

On allotments containing critical winter range for deer, forage utilization would be determined at the end of the livestock grazing season (fall-winter period) and also before livestock turn-on in the spring. The purpose would be to determine the amount of use made on desirable forage species preferred by cattle, sheep, and deer and what animal is making that use. At the end of the 3-year period, livestock use would be adjusted to assure adequate deer forage remains after livestock use has been made. This would apply to the following allotments:

Meachum Canyon
Big Creek
Bear Lake
Laketown
South Woodruff
Woodruff Pastures
Eastman
Stuart

On allotments containing only seasonal deer range, utilization by livestock would be measured at the end of the grazing period (fall). Livestock use would be restricted similar to the manner described above to allow for adequate dietary diversity and forage quality. This would occur on these allotments:

Twin Peaks
Rabbit Creek
Dry Basin
Kearl
Sage Creek
Duck Creek
New Canyon
Middle Ridge
East Woodruff

The following example shows how livestock utilization would be restricted to provide additional quality forage to deer:

Kearl Allotment

Past active authorized use (Appendix 3): 504 AUMs

Existing livestock forage utilization (table 2-10): 54 percent

Adjustment in livestock use to 40 percent utilization:

$$\frac{504 \text{ AUMs}}{54 \text{ percent utilization}} :: \frac{X \text{ AUMs}}{40 \text{ percent utilization}}$$

$$\begin{aligned}
(54 \text{ percent})(X \text{ AUMs}) &= (40 \text{ percent})(504 \text{ AUMs}) \\
.54 \; X &= 201.6 \text{ AUMs} \\
X &= \frac{201.6}{.54} \\
X &= 373 \text{ AUMs of forage used by livestock at 40 percent utilization}
\end{aligned}$$

The remaining 131 AUMs of livestock forage (504-373) would be available (at least to some degree) to deer.

This example illustrates how the results of the proposed study would be used to determine forage allocation. A 3-year study period is proposed to allow for variable climatic and plant growth factors. A shorter period could be used providing data were adjusted to compensate for any deviation from normal forage production. For analysis purposes, estimates were made for the initial level of livestock and deer allocation that could be available upon implementation of this alternative.

Utilization of livestock forage would be restricted to 40 percent of the current annual vegetative growth (assumption made to provide allocation estimates). Allotments with existing livestock use (Appendix 4) in excess of 40 percent utilization (table 2-10) would be reduced; livestock use on those allotments having less than 40 percent utilization would be increased to 40 percent. This would apply to all allotments except Meachum Canyon and East Woodruff, where existing livestock use would be maintained. The amount of livestock forage determined from this procedure would be reduced to accommodate fencing of select aquatic/riparian habitats (Part 1) and public land disposals (2,611 acres).

Tables 1 in this appendix and 8-15 identifiy the estimated livestock and wildlife forage allocation that would be available under this alternative. The actual allocation would vary depending on the results of the utilization studies.

TABLE 1

Alternative 3: Proposed Livestock Forage Allocation and Vegetation Treatment

Allotment	Acres	Stocking[a] Level During 3-Year Study (Past Active - Constraints)	Constraints				AUMs Change[b] Needed to Establish 40% Utilization on Bluebunch Wheat-grass (+ or -)	Vegetation Treatment of Suitable Acres (Increased AUMs)		Total AUMs[c] After Full Implementation
			Riparian Fencing		Land Actions (Includes Recreation Sites)					
			Acres	AUMs	Acres	AUMs		Acres	AUMs	
Bear Lake	1,198	152	0	0	80	16	-49	265	2	105
Big Creek	20,346	3,757	59	59	321	64	-1,445	11,293	1,223	3,535
Deseret	15,557	2,389	0	0	190	38	+1,766	0	0	4,155
Dry Basin	2,781	471	0	0	0	0	+254	2,082	57	782
Duck Creek	13,410	1,893	0	0	160	32	-746	7,952	1,057	2,204
Eastman	3,405	632	0	0	80	16	-172	0	0	460
East Woodruff	2,167	175	0	0	0	0	[d]0	299	46	221
Kearl	1,183	504	0	0	0	0	-131	371	12	385
Laketown	3,241	206	93	93	0	0	-23	88	1	184
Meachum Canyon	1,951	264	0	0	0	0	[d]0	1,204	39	303
Middle Ridge	1,286	103	0	0	1,286	[e]103	0	0	0	0
New Canyon	30,665	4,626	261	261	218	43	-1,490	5,756	918	4,054
Rabbit Creek	3,257	484	0	0	0	0	+39	2,087	81	604
Sage Creek	10,153	1,031	0	0	25	5	-222	4,248	361	1,170
Session	238	40	0	0	238	[e]40	0	0	0	0
South Woodruff	4,251	367	0	0	0	0	-169	0	0	198
Stuart	1,042	102	0	0	0	0	-28	718	65	139
Twin Peaks	2,292	236	35	35	0	0	+127	537	26	389
Woodruff Pastures	21,875	4,804	0	0	20	0	-1,601	9,965	717	3,920
TOTALS	140,298	22,236	448	448	2,618	357	-3,890	46,865	4,605	22,808

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[a] Stocking level determined by subtracting constraints applied this alternative from past active authorized livestock use (Appendix 4).

[b] A (-) indicates livestock AUMs reduced from 3-year study stocking level; a (+) indicates AUMs added to the 3-year study stocking level. These adjustments would be required to achieve a 40-percent utilization level.

[c] Includes management increase and AUMs from water developments.

[d] No additional livestock forage proposed due to conflicts with deer.

[e] Disposal of public land and elimination of grazing proposed. It is proposed that this would occur during the 3-year study period.

G

GLOSSARY

Acre-Foot. A volume that will cover an area of one acre to a depth of 1 foot (43,560 cubic feet).

Aesthetics. Dealing with the nature of the beautiful and with judgments concerning beauty.

Allotment. An area of land where one or more operators graze their livestock. Generally consists of public land but may include parcels of private or state lands. The number of livestock and season of use are stipulated for each allotment. An allotment may consist of several pastures or be only one pasture.

Allotment Management Plan (AMP). A concisely written program of livestock grazing management, including supportive measures, if required, designed to attain specific management goals in a grazing allotment.

Animal Unit Month (AUM). The amount of forage required to sustain the equivalent of 1 cow or 5 sheep for 1 month.

AUM Capital Value. Economic value reflected in the open market for an AUM of forage.

Base Property. Those lands in a ranching enterprise which are owned or under long-term control of the operator and have the capability to sustain the number of livestock for a specified time period for which a grazing privilege is sought (base property requirement).

Base Property Qualifications. Those qualifications or privileges which are directly attached to or supported by base property. The maximum amount of grazing privileges on Federal range property allowable to base properties.

Carrying Capacity. The maximum stocking rate possible without inducing damage to vegetation or related resources such as watershed. This incorporates such things as the suitability of the range to grazing as well as the proper use which can be made on each and all the plants within the area. Normally expressed in terms of acres per animal unit month (AC/AUM) or sometimes referred to as the total AUMs that are available in any given area such as an allotment. Areas that are unsuitable for livestock use are not computed in the carrying capacity. This may or may not be the same as the stocking rate.

Climax Community. The final vegetative community which emerges after a series of successive vegetational stages and perpetuates itself indefinitely unless disturbed by outside forces.

Coliform. A general term for the group of bacteria which comprise all of the aerobic and facultatively anaerobic, gramnegative (type of strain related to cell wall composition) nonspore-forming, rod-shaped bacteria which ferment lactose (millsugar) with gas formation within 48 hours at 35 degrees C.

Community. An aggregate of organisms which form a distinct ecological unit. Such a unit may be defined in terms of plants, animals, or both.

Critical Wildlife Habitat. That portion of the living area of a wildlife species that is essential to the survival and perpetuation of the species either as individuals or as a population.

Cultural Resources. Those fragile and nonrenewable remains of human activity, occupation, or endeaver reflected in districts, sites, structures, buildings, objects, artifacts, ruins, works of art, architecture, and natural features that were of importance in human events. These resources consist of (1) physical remains; (2) areas where significant human events occurred, even though evidence of the event no longer remains; and (3) the environment immediately surrounding the actual resource. Cultural resources, including both prehistoric and historic remains, represent a part of the continuum of events from the earliest evidences of man to the present day.

Current Year's Growth. The amount of vegetative growth that occurs in the period of one year.

Deferred Rotation Grazing. Discontinuance of grazing on various parts of a range in succeding years, allowing each part to rest successively during the growing season to permit seed production, establishment of seedlings, or restoration of plant vigor. Two, but usually 3 or more separate units are required. Control is usually insured by unit fencing, but may be obtained by camp unit herding.

Desirable Plants. Those plants which are palatable and productive forage species, often are dominant under climax or near climax conditions. They are normally long-lived plants which can include grasses, forbs, and browse. These plants are to be maintained or increased by intensive livestock management.

Exchange of Use. An agreement made with a licensee having ownership or control of nonfederal land interspersed and grazed in conjunction with surrounding federal range. This agreement specifies the carrying capacity and gives the Bureau control of the nonfederal land for grazing purposes.

Fair Condition. A range is in fair condition if the plant composition is 15 to 39 percent of desirable and intermediate species with 5 or more percent made up of desirable species. Soil surface factor (SSF) is less than 60. Also, those ecosystems where the composition comprises 60 percent or more of intermediate species and less than 5 percent desirable species are present will be rated "fair" when SSF is less than 60.1. The actual parent compositions by species is determined by paced transect and ocular reconnaissance procedures. Soil surface factor is determined by an onsite investigation and evaluation.

Fertility, Soil. Refers to the status of a soil with respect to the amount and availability to plants of elements necessary for plant growth.

Field Capacity. The percentage of water remaining in a soil 2 or 3 days after having been saturated and after free drainage has practically ceased.

Forage. Vegetation of all forms available for animal consumption.

Forage Acre Factors. The net forage acre factor is a figure representing the portion of a surface area which is completely covered with completely usable forage. This factor is expressed as a decimal figure - e.g., 0.05, 0.10, etc. Surface acres multiplied by the net forage acre factor give forage acres.

Forage Requirements. Generally, it will be expedient to assemble a part or all of the basic use data needed to complete adequate forage requirement studies before the survey field work begins. This could be done by the chief of party during the course of the survey, but it will be well to have at least selected the study areas before the field season to insure their coverage as an integral part of the survey. Grazing use data could be advantageously entered on standard forms used to record estimates of actual use.

Forage Requirement Studies. Forage requirement studies are best made on representative allotments or pastures which are considered to have been grazed at or near a proper rate, and for which a reliable use history may be assembled. Such typical areas should be within or near the survey area and must be covered by the survey. Ownership of these tracts is unimportant. However, they must adequately represent the survey area; the required use information must be available, and there must be opportunity for field inspection.

Forb. A broadleaved herb other than grass; a weed.

Frost Heaving. The movement of soil caused by the freezing of soil moisture.

Good Range Condition. A range is in good condition if plant composition is 40 percent or more of both desirable and intermediate species with at least 20 percent of the composition made up of desirable species and has a SSF less than 40. Species composition is determined using paced transects and ocular reconnaissance procedures and the SSF is determined directly through field investigation and evaluation.

Grazing Cycle. The number of years required to apply all of the treatments in the grazing formula to each pasture of the allotment. In other words, it is the completion of 1 full cycle of yearly schedules back to the point of beginning.

Grazing System. A systematic sequence of grazing use and nonuse of an allotment to reach identified multiple use goals or objectives by improving the quality and quantity of the vegetation.

Habitat. A specific set of physical conditions that surround the single species, a group of species, or a large community. In wildlife management, the major components of habitat are considered to be food, water, cover, and living space.

Hedging. The persistant browsing of terminal buds of browse species causing excessive lateral branching and a reduction in upward growth.

Herb. A seed-producing plant that does not develop persistant woody tissue.

Intensity of Use. Amount of vegetation consumed by grazing herbivores over a given time period.

Key Species. A plant that is a relatively or potentially abundant species. It should be able to endure moderately close grazing, and serve as an indicator of changes occurring in the vegetational complex. The key species is an important vegetative component that if overused, will have a significant effect on watershed conditions, grazing capacity, or other resource values. More than 1 key species may be selected on an allotment. For example, a species may be important for watershed protection, and a different species may be important for livestock forage or wildlife forage, etc.

Lek. A site to which birds regularly resort for purposes of sexual display or courtship.

License. An authorization which permits the grazing of a specified number and class of livestock on a designated area of grazing district lands for a period of time, usually not in excess of 1 year.

Litter. A surface layer of organic debris consisting of freshly fallen or slightly decomposed organic material. Litter is essential because it covers and protects the soil, reduces runoff rates, increases infiltration, and because it is continually being broken down, it yields organic matter which improves soil fertility.

Loam. A soil in which both fine particles (silt and clay) and coarse (sand) sizes are found.

Macroinvertebrate. Large animals; invertebrate.

Management Framework Plan (MFP). Land use plan for public lands which provides a set of goals, objectives and constraints for a specific planning area; a guide to the development of detailed plans for the management of each resource.

Nonrenewable Use. Nonrenewable grazing permits or leases may be issued to qualified applicants when forage is temporarily available, provided this use does not interfere with existing livestock operators on the public lands and it is consistent with land use plans. This use shall be authorized on an annual basis only.

Ocular Reconnaissance Survey. A forage survey method which inventories vegetation by estimating total forage density, percent composition by species and total usable forage in a given range type to determine the carrying capacity for livestock and wildlife. All of the range surveys in Washington County utilized this method of survey to determine carrying capacity.

Off-Road Vehicle (ORV). Any motorized vehicle designed for or capable of cross-country travel on or immediately over land, water, sand, snow, ice, marsh, swampland or other terrain.

Palatability. The relish with which a particular plant species or part is consumed by an animal. The palatability of a plant is usually related to its ecological significance as far as succession is concerned. That is, highly palatable plants are usually those which are a desirable species and decrease with increasing grazing pressure. Conversely, a low palatability usually characterizes a species which is least desirable and increases with increasing grazing pressure.

Percent Use. Grazing use of current growth, usually expressed as a percent of weight removed.

Perennial Plant. A plant that has a life cycle of 3 or more years. Because of their longevity, it is desirable to base management on these species.

Permit. An authorization which allows grazing of a specific number and class of livestock on a designated area of grazing district lands during specified seasons each year for a period of usually 10 years.

Phenology. The science concerned with periodic biological events in their relation to seasonal climatic changes. Plant phenology refers to dates of sprouting, flowering, seed production, and regrowth, as well as other observable occurrences in plant development. Essential in developing a grazing system which will compliment or conform with seasonal plant requirements.

Plant Vigor. The relative well being and health of a plant as reflected by its ability to manufacture sufficient food for growth and maintenance.

Proper Use Determination. "Proper use" for a particular plant is the degree to which its current growth will be utilized by a kind of grazing animal by determining the differences between total current production in a normal growth year and the amount left after proper use. They indicate all removal in the process of grazing, including wastage by trampling. Any foliage removal or damage by rodents, insects, or disease is provided for under utilization deductions, and is therefore not considered in establishing proper use factors. If a plant provides no forage for a kind of grazing animal during a particular season, it is rated zero for that combination, although it may be present on the range and supply forage at other seasons. This may especially be the case for winter ranges where some plants are evident during the growing season but are unable to provide forage during the dormant period.

Public Lands. Tracts of land administered by the Bureau of Land Management. Formerly called national resource lands or public domain.

Range Condition. In this case should be referred to as grazing condition. Grazing condition is based on the percent of desirable forage in the composition for livestock and the existing erosion condition of a site. Condition of the range must include consideration of vegetation quality and quantity and soil erosion characteristics. Present range condition is determined by direct field examination which includes transect and ocular reconnaissance procedures as well as determination of the soil surface factor (SSF).

Range Trend. This is the change in vegetation and soil characteristics as a direct result of environmental factors, primarily climate and grazing. Studies in range trend are used in combination with other studies to evaluate allotment management plans and grazing systems. Trend data is collected on key areas and relies on key species to represent the pasture or allotment. A trend index is used in evaluating trend data. This index is computed by adding the following factors: composition of key species, total cover of key species, number of seedings of key species, and percent litter in entire plot. Any change in range trend is reflected by a corresponding rise or decline in the trend index.

Rest. Refers to seasonal resting from grazing of a range to allow plants to replenish their food reserves, allow seeds to ripen, seedlings to become established, and allow litter to accumulate between plants.

Riparian Vegetation. Plants that are adapted to moist growing conditions found along waterways, ponds and generally moist environments.

SCS Range Site. A range site is a distinctive kind of rangeland that differs from other kinds of rangeland in its ability to produce a characteristic natural plant community. A range site is the product of all the environmental factors responsible for its development. It is capable of supporting a native plant community typified by an association of species that differs from that of other range sites in the kind or proportion of species or in total production.

Season Long Use. Grazing use made during an entire season such as summer or winter. Usually the same use is made each year.

Soil Association. A group of defined and named taxonomic soil units occurring together in individual and characteristic patterns over a geographic region. Comparable to plant associations in many ways.

Soil Surface Factor (SSF). A numerical expression of surface erosion activity caused by wind and water as reflected by soil movement, surface litter, erosion pavement, pedcatalling, rills, flow patterns, and gullies. Values may vary from 0 for no erosion to 100 for severe erosion conditions. A determination of the SSF is made directly in the field by evaluating each of the above factors.

Stocking Rate. The degree to which a grazing unit is stocked with livestock, usually expressed in AUMs. The stocking rate may be more or less than the carrying capacity.

Succulent. Having fleshy or juicy tissues.

Total Allowable Proper Use Factors (TAPUF). Wherever more than one kind of animal makes substantial use of a range use area, total allowable proper use factors will be derived and used in grazing capacity computations for that area. These factors will represent the maximum limit of the combined use to be made of any species for a particular range and season, and will be the result of judgment weightings of the factors for each kind of animal, considering a number of critical influences concerning the use complex and the nature of the range. Usually, the total allowable proper use factor will not be greater than that normally allowed the kind of animal having a preference for the species.

Trespass. The grazing of livestock on a range area without proper authority, and resulting from a negligent or willful act.

Turn-on Date. Specific day on which livestock are legally allowed to enter and graze stipulated area.

Turn-off Date. Specific day on which grazing is to be terminated and livestock removed from a stipulated area.

Undesirable Plants. Consist principally of invaders, noxious, and low value forage plants. The aim in management is to improve range condition to a point where these species are replaced by desirable or intermediate species.

Utilization. The proportion of the current year's forage production that is consumed or destroyed by grazing animals. This may refer either to a single species or to the whole vegeative complex. Utilization is expressed as a percent by weight, height, or numbers within reach of the grazine animal. The percent utilization largely determines whether the productivity of the range will be lowered or improved and thus directly influences range trend and condition. Since utilization data actually records the effect of livestock grazing on the vegetation and related resources, particularly for watershed, it is possible to determine the correct grazing capacity directly from utilization information. Any adjustments in carrying capacity will be in direct proportion to the utilization desired by the following formula:

$$\frac{\text{Average Percent Utilization (present)}}{\text{Desired Utilization (if properly used)}} = \frac{\text{AUMs use at present (actual use)}}{\text{AUMs to obtain desired use}}$$

When this relationship is used in calculating carrying capacity, both utilization data and actual use information is examined for the same period.

Vegetation Type. A plant community with distinguishable characteristics. A more or less distinct vegetation unit which may be delineated on the basis of aspect, composition, or density.

Wilting Point. The point at which plants wilt due to a lack of available soil water.

Abb

LIST OF ABBREVIATIONS

ACEC = Area of Critical Environmental Concern
AMP = Allotment Management Plan
AUM = Animal Unit Month
BLM = Bureau of Land Management
DES = Draft Environmental Statement
ES = Environmental Statement
FAF = Forage Acre Factor
FAR = Forage Acre Requirement
FES = Final Environmental Statement
MFP = Management Framework Plan
PAA = Planning Area Analysis
PUF = Proper Use Factor
RR = Range Readiness
SCORP = Utah State Comprehensive Outdoor Recreation Plan
SCS = Soil Conservation Service
SSF = Soil Surface Factor
TAPUF = Total Allowable Proper Use Factor
TDS = Total Dissolved Solids
UDWR = Utah Division of Wildlife Resources
URA = Unit Resource Analysis

R

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1 DESCRIPTION OF PROPOSED ACTION

2 DESCRIPTION OF THE ENVIRONMENT

3 THE PROBABLE ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

4 MITIGATING MEASURES NOT INCLUDED IN THE PROPOSED ACTION

5 ANY ADVERSE IMPACTS WHICH CANNOT BE AVOIDED SHOULD THE PROPOSAL BE IMPLEMENTED

6 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

7 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

8 ALTERNATIVES TO THE PROPOSED ACTION

9 CONSULTATION AND COORDINATION

App APPENDIXES

G GLOSSARY

Abb LIST OF ABBREVIATIONS

R REFERENCES CITED

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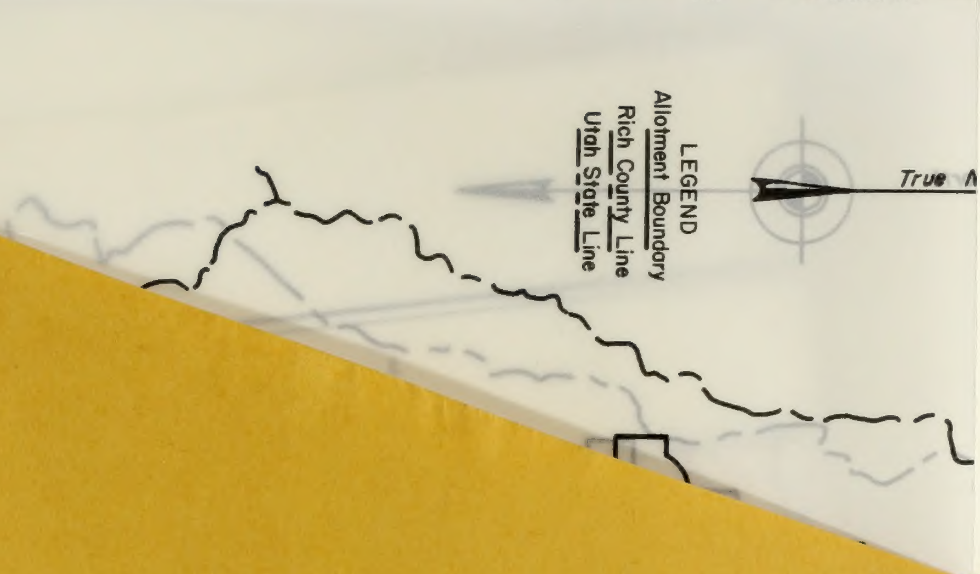

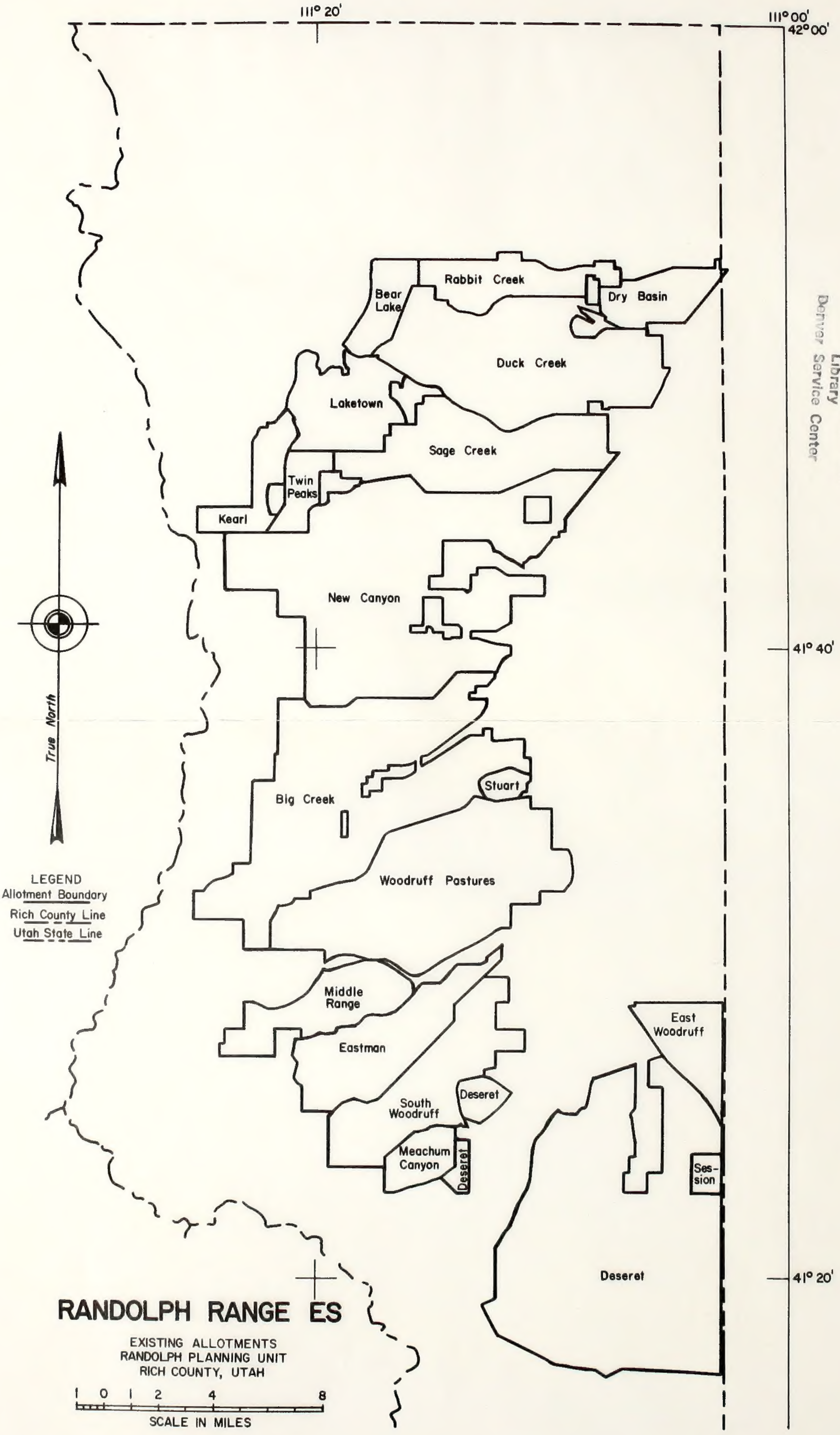

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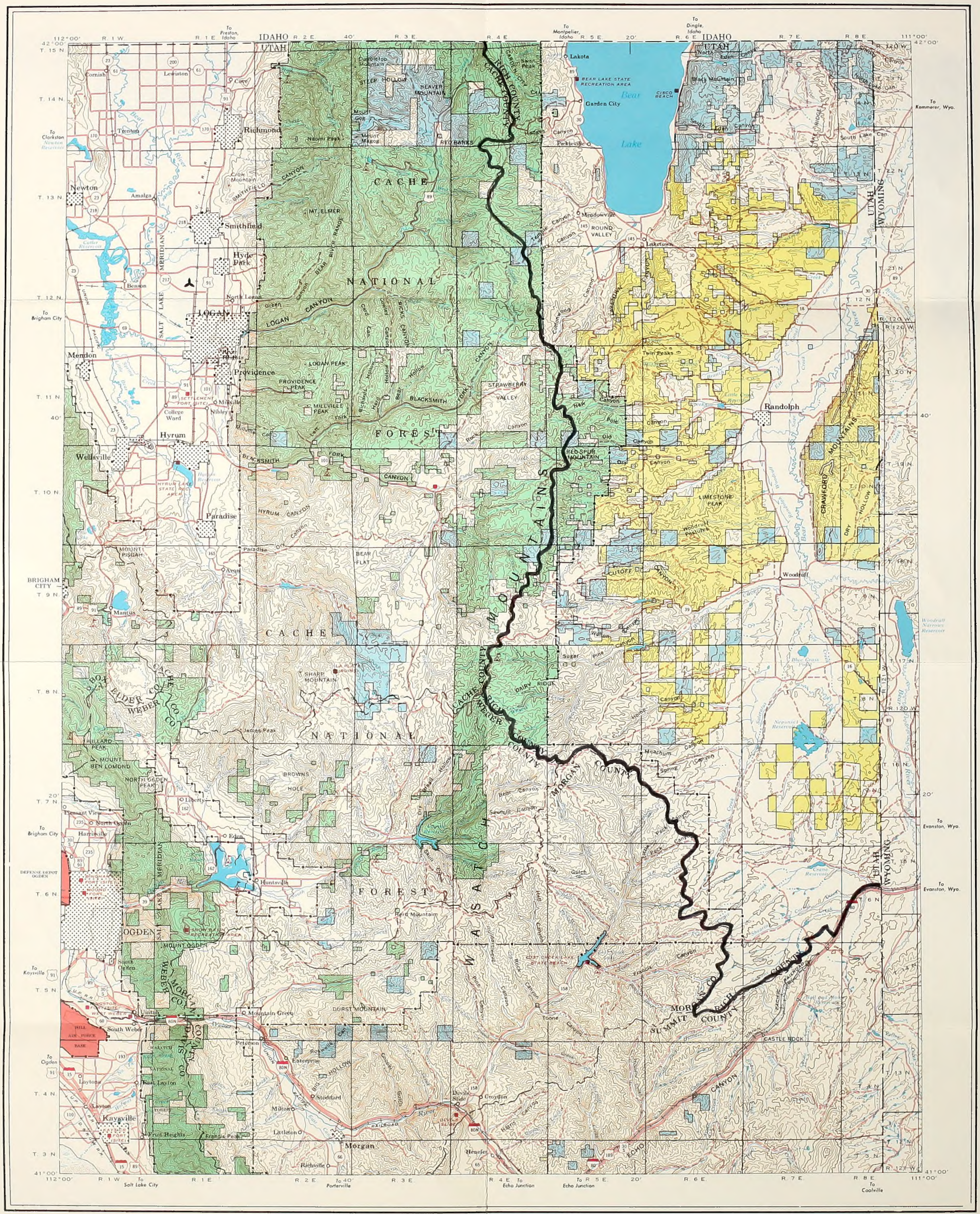

LEGEND

- 🟨 PUBLIC LAND
- ⬜ PRIVATE LAND
- 🟥 MILITARY RES. & WDLS.
- 🟦 STATE LAND
- 🟩 NATIONAL FOREST

The base grid was compiled by the Bureau of Land Management from the official records of cadastral surveys. Map information was taken from maps prepared by the Army Map Service (FSGE), Corps of Engineers, U.S. Army, Washington, D.C., and quadrangles prepared by the U.S. Geological Survey.

The land status was compiled for printing by the Bureau of Land Management from the official federal records with additional data furnished by the Utah State Land Board, and U.S. Forest Service maps.

Contour interval 200 feet with supplementary contours at 100 foot intervals. Polyconic projection.

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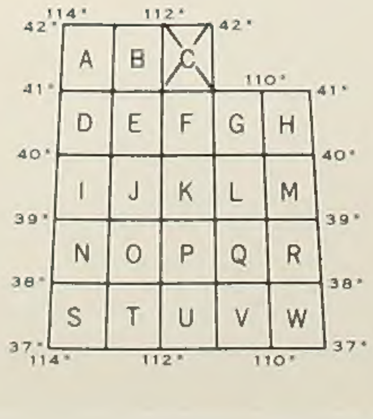

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